Dissertation on

"A STUDY ON EVALUATION OF EFFICACY OF OPTIMISED LABOUR PROTOCOL"

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INSTITUTE OF SOCIAL OBSTETRICS,

GOVT KASTURBA GANDHI HOSPITAL,

MADRAS MEDICAL COLLEGE & HOSPITAL.

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CERTIFICATE

This is to certify that the dissertation **"EVALUATION ON EFFICACY OF OPTIMISED LABOUR PROTOCOL"** presented herein by Dr.P.Ramya Chitra, is an original work done in the Department of Obstetrics & Gynaecology , **Institute of Social Obstetrics and Government Kasturba Gandhi Hospital**, Government Madras Medical College, Chennai, in partial fulfilment of regulations of The Tamil Nadu Dr. M.G.R. Medical University for the award of degree of M.D. (Obstetrics &Gynaecology) , under my guidance and supervision during the academic period 2010-2012.

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DECLARATION

I, Dr.P.RAMYA CHITRA solemnly declare that this dissertation, titled **"EVALUATION ON EFFICACY OF OPTIMISED LABOUR PROTOCOL"** is a bonafide record of work done by me in the Department of Obstetrics & Gynaecology, **Institute of Social Obstetrics and Government Kasturba Gandhi Hospital**, Government Madras Medical College, Chennai, under the guidance of **Dr.P.M.GOPINATH, M.D., D.G.O,** Director, ISO & KGH, Chennai.

This dissertation is submitted to The Tamil Nadu Dr. M.G.R. Medical University, Chennai in partial fulfilment of the University regulations for the award of degree of M.D. (Obstetrics & Gynaecology) examination to be held in April 2012.

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To
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Dear Dr. P. Ramya Chitra

The Institutional Ethical Committee of Madras Medical College reviewed and discussed your application for approval of the project / proposal / clinical trail entitled "Evaluation of Optimised Labour Protocol in a study among primi gravida in terms of reduction and total duration of labour and pain relief" No 50082010.

The following members of Ethical committee were present in the meeting held on 24.08.2010 conducted at Madras Medical College, Chennai -3.

1. Prof. S.K. Rajan, MD	-- Chairperson
2. Prof. J. Mohanasundaram, MD,Ph.D,DNB Dean, Madras Medical College, Chennai -3	-- Deputy Chairman
3. Prof. A. Sundaram, MD Vice Principal , MMC, Chennai -3	-- Member Secretary
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6. Prof. Md. Ali, MD, DM	-- Member
Professor & Head ,,Dept. of MGE, MMC, Ch-3	-- Member
7 Prof. Shantha Ravishankar, MD Professor of Neuro Pathology, MMC, Ch-3	-- Member
8. Tmt. Arnold Soulina	-- Social Scientist

We approve the trail to be conducted in its presented form.

Sd /. Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, any SAE occurring in the course of the study, any changes in the protocol and patient information / informed consent and asks to be provided a copy of the final report

Member Secretary, Ethics Committee

CONTENTS

INTRODUCTION

Labour pains have been described as one of the most excruciating pains that a human being can experience. This process applies to all social and ethnic groups and has probably been so since mankind walked upright. It is difficult to measure the pain which is recognised via signals carried through the nervous system and the women's intellectual response to the stimulus.

Women have suffered from the pangs of child birth through centuries, however the attitude towards the pain relief has been conflicting. Pain relief is known to allay fear and anxiety and provide a more favourable environment for improved obstetric outcome. Epidural analgesia have proven to be beneficial and has contributed significantly to pain relief and improved obstetric outcome.[2] In India, wherein the majority of women are cared for in small community hospitals and private maternity homes, facilities for providing epidural analgesia continues to remain a distant dream.

Programmed labour protocol is based on incorporation of

- Active management of labour and
- Labour analgesia
- Partographic monitoring

For the mother it provides relief from pain, controls alteration in circulation, ventilation ,undue muscular efforts, shorter and less traumatic labour.

For the fetus, protection against hypoxia , fetal depression at birth, protection against needless instrumental delivery.

To the obstetrician, it provides a better control over events emerging during the course of labour and ensures optimum conditions to prevail at the time of child birth.

The widespread use of amniotomy and Oxytocin augmentation to optimize labour coupled with judicious use of analgesics help to ensure steady progress of labour reduces the risk of dysfunctional labour and enables early identification of emerging obstetric problems.[1]

It is well established that prolonged labours predispose to infection, dehydration, ketosis, exhaustion in the mother as well as fetal distress and increased morbidity in the unborn baby.

AIM

The aim of the study is to evaluate the efficacy of Programmed Labour protocol in a study group as against Spontaneous progression of labour,in providing shorter, safer and relatively pain free delivery and also to analyse the outcome of Programmed labour protocol in respect to the

1. Mean rate of cervical dilatation

2. Mean duration of Active phase of labour

3. Mean duration of Second stage of labour

4. Mean duration of Third stage of labour

5. Average blood loss

6. Pain relief in labour

7. Mode of Delivery

8. APGAR scores

PHYSIOLOGY OF PAIN IN LABOUR

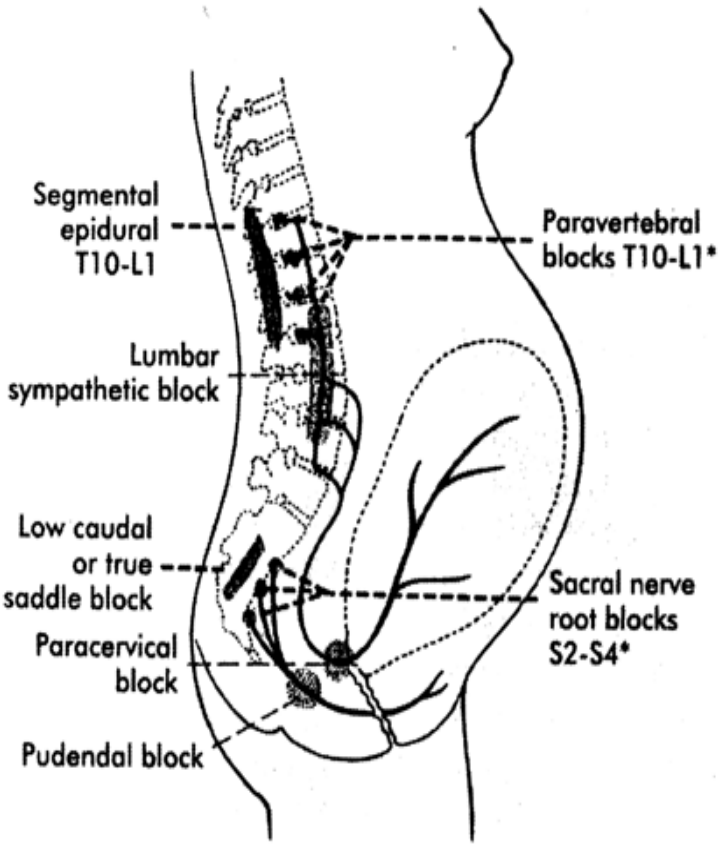
Physiology of pain in labour

Labour pain is the result of many complex interactions, physiological and psychological, excitatory as well as inhibitory. Pain during the first stage of labour is due to distension of the lower uterine segment, mechanical dilatation of the cervix and lastly due to stretching of excitatory nociceptive afferents resulting from the contraction of the uterine muscles.[2] The severity of pain parallels with the duration and intensity of contraction[3]. In the second stage additional factors, such as traction and pressure on the parietal peritoneum, uterine ligaments, urethra, bladder, rectum, lumbosacral plexus, fascia and muscles of the pelvic floor increase the intensity of pain

Neural pathway of pain

The uterus and cervix are supplied by afferents accompanying sympathetic nerves in the uterine and cervical plexuses, the inferior, middle and superior hypogastric plexuses and the aortic plexus. The small unmyelinated ' C' visceral fibres[4] transmit nociception through lumbar and lower thoracic sympathetic chains to the posterior nerve roots of the 10th, 11th and 12th thoracic and also to 1st lumbar nerves to synapse in the dorsal horn[5]. The chemical mediators involved are bradykinin, leukotrienes, prostaglandins, serotonin, substance P and lactic acid[6]. As the labour progresses severe pain is referred to the dermatomes supplied by T10 and L1.

In the second stage, the direct pressure by the presenting part on the lumbosacral plexus causes neuropathic pain. Stretching of the vagina and perineum results in stimulation of the pudendal nerve (S2,3,4) via fine, myelinated, rapidly transmitting 'A delta' fibres[4]. From these areas, the impulses pass to dorsal horn cells and finally to the brain via the spino-thalamic tract.



The stress response to pain in labour

Segmental and supra-segmental reflex-responses from the pain of labour may affect respiratory, cardiovascular, gastro-intestinal, urinary and neuro-endocrine functions.

Respiratory - Pain in labour initiates hyperventilation leading to maternal hypocarbia, respiratory alkalosis and subsequent compensatory metabolic acidosis. The oxygen dissociation curve is shifted to the left and thus reduces tissue oxygen transfer, which is already compromised by the increased oxygen consumption associated with labour[7].

Cardiovascular - Labour results in a progressive increase in maternal cardiac output, primarily due to an increase in stroke volume, and, to a lesser extent, maternal heart rate. The greatest increase in cardiac output occurs immediately after delivery, from the increased venous return associated with relief of venocaval compression and the autotransfusion resulting from uterine involution.

Hormonal - Stimulation of pain results in the release of beta-endorphine and ACTH from the anterior pituitary. Associated anxiety also initiates further pituitary response[8].

Pain also stimulates the increased release of both adrenaline and noradrenaline from the adrenal medulla which may lead to a progressive rise in peripheral resistance and cardiac output. Excessive, sympathetic activity may result in incoordinate uterine action, prolonged labour and abnormal fetal heart-rate patterns. Activation of the autonomic nervous system also delays gastric emptying and reduces intestinal peristalsis.

Metabolic - **Maternal**: During labour, glucagon, growth hormone, renin and ADH level increases while insulin and testosterone level decreases[8]. Circulating free fatty acids and lactate also increase with a peak level at the time of delivery.

Fetal : Maternal catecholamines secreted as a result of labour pain may cause fetal acidosis due to low placental blood flow[9].

Severity of labour pain

The severity of labour pain varies greatly among women in labour. If women are asked during or shortly after birth to score their labour pain most rate it as severe while few mention little or no pain[10,11]. Using the McGill pain questionnaire, Melzack et al in Montreal, Canada, found that labour pain usually rated a high score particularly among primiparae, those with a history of dysmenorrhoea and those belonging to low socio-economic status[10].

HISTORY OF PAIN RELIEF

Ancient methods of pain relief included various plant-derived sedatives, acupuncture and physical methods such as binding.

- In **1847** James Young Simpson administered the first obstetric general anaesthetic using ether.
- In **1853** John Snow delivered Queen Victoria's eighth child under chloroform.
- In **1881** Stanislav Klikovitch described the use of nitrous oxide for labour in Russia.
- In **1902** morphine and hyoscine was first used in labour. Pethidine was first used in **1940**.
- In **1931** Eugen Bogdan Aburel, Romanian obstetrician, described continous caudal plus lumboaortic plexus blocks in labour.
- In **1945** Curtis Mendelson described the syndrome of acid aspiration under general anaesthesia for caesarean section.
- In **1949** Cleland described continuous lumbar epidural block in labour.
- In **1958** Ferdinand Lamaze published his book suggesting that pain was a conditioned reflex triggered by uterine contractions, and that psychoprophylaxis could reduce pain.

- In **1961** Brian Sellick described cricoid pressure as a means of preventing gastric aspiration.

METHODS OF LABOUR PAIN RELIEF

Principles of pain relief

The essentials of obstetric pain relief are

- Simplicity
- Safety
- Preservation of fetal homeostasis

Women who are given any form of analgesia should be monitored closely with frequent measurements of blood pressure, level of consciousness and maternal oxygen saturation by pulseoximetry.

Psychological methods of pain relief

Methods of psychological analgesia can be divided into three broad categories:

- Natural child birth - the Read method.
- Psycho prophylaxis - the Lamaze technique.
- Hypnosis

Each technique claims the elimination of pain without any harm to the mother, the baby or to the progress of labour and without the need for chemical analgesia. All require adequate antenatal preparation. Still most women experience severe labour pain[10]. Furthermore, psychological analgesia can place increased demand on the staff.

Support during labour

A friendly atmosphere in the labour room is preferable to help a woman to cope with pain. Homely surroundings help to allay anxiety and reduce the need for pharmacological analgesia.

- **Hypnosis**. Hypnosis (Hypnos, sleep) can produce analgesia and amnesia during labour and delivery for some selected patients. Only about 25% of women however are suitable as deep trance hypnotic subjects. And the technique relies on extensive preparation.
- **Bio-feedback**. This is borderline between psychological and physical methods of analgesia. Relaxation is a major component of psychological preparation for child-birth and is claimed to relieve pain, reduce anxiety and speed labour.

Physical Methods of Pain Relief

- **Transcutaneous Electrical Nerve Stimulation (TENS)**. TENS was introduced to relieve pain in childbirth in the early 1980s. Since then the use of TENS in labour has become increasingly popular as it is simple to use and is non-invasive. The mode of action depends on the two principal theories. One that A-fibres are stimulated by the electrical stimulation preventing the transmission of afferent noxious stimulus originating from C-fibres, the other that the electrical stimulus increases endorphines and enkephalins within the system. TENS electrodes are applied over the

dermatomes supplied by T10 to L1. The TENS machine then gives a low background stimulus which can be augmented at the time of each contraction. It has been observed in clinical practice that TENS may provide limited pain relief during the first stage of labour. Meta-analysis of randomised controlled trials of TENS in labour does not, however, confirm its efficacy.

- **Acupuncture**. Mentioned in the literature in 581 B. C. and widely practiced in China. Acupuncture is not used for childbirth in China, however, and there are no acupuncture points described for pain relief in labour.

- **Water (bath or shower)**. A bath or shower is relaxing and should be encouraged. There has been enthusiasm in some quarters to extend this to the delivery of the baby under water and many maternity units have the facility to offer water birth. However, while its use during the first stage of labour is not discouraged, very few units would encourage the use of the birthing pool for the delivery of the baby. At present there is little evidence to support the use of immersion in water during labour.

Systemic Opioid Analgesia

Opioids have been used for anaesthesia in labour for hundreds of years. However, it was not until the early twentieth century that techniques deliberately employing the analgesic effects of the opioids gained major attention.

- **Pethidine** has become the most commonly used and widely investigated systemic opioid in labour. It is principally a mu agonist but of a low potency. Administered as hydrochloride in a dose of 75-100mg intramuscularly it reduces labour pain by about 25%. Delayed gastric emptying is a prominent feature. Respiratory depression is not usually observed in women who receive pethidine, because contractions continue to be painful and to provoke hyperventilation. However hypoxic episodes have been observed probably associated with significant underventilation between contractions. The major metabolite, norpethidine, is itself active, and has convulsant properties. Thus, pethidine may be inadvisable for use in fulminating preeclampsia or eclampsia, particularly in repeated doses.
- **Morphine** fell from favour in the first half of the twentieth century, in part because of its association with "twilight sleep" and in part because of its addictive side effects.
- **Meptazinol** is a mixed opioid agonist/antagonist, act primarily at the kappa receptor. It is given in a dose of 100-150mg intramuscularly every 2-4 hours. In high doses it has dysphoric side effects and also produce nausea and vomiting. The antagonist properties of meptazinol may cause withdrawal in parturients dependent on mu-agonists. It has a reduced potential to cause respiratory depression.
- **Buprenorphine** is a partial agonist acting selectively at mureceptors. It is about 20 times as potent as morphine and has a high affinity for opioid receptors and slow dissociation from them. It has a capacity for self-

antagonism, which tend to produce a biphasic time course of action. This may be observed for both analgesia and respiratory depression.

- **Nalbuphine** is a synthetic mixed mu-agonist/antagonist and a kappa-agonist. For analgesia in labour it is given in doses of 10-20mg intramuscularly. Maternal or foetal respiratory depression is less likely with nalbuphine due to the ceiling effect. The chief disadvantages of this drug are sedation and dysphoria.
- **Fentanyl** primarily acts on mu-receptors and is approximately 80-100 times as potent as morphine. It has a rapid onset action and shorter duration of action. The peak analgesic effect occurs within 5 minutes and the duration of effect is about 30 minutes after 1 mcg/kg administered intravenously. Fentanyl is principally bound to albumin which favours its transplacental transfer. For analgesia in labour 50-100mcg/hour is required, given in increments of 10mcg IV.
- **Tramadol** is a weak mu-agonist that has been prescribed in labour in doses of 50-100mg 4 hourly. . It is a central analgesic with a low affinity for opioid receptors. Its selectivity for mu receptors has recently been demonstrated, and the M1 metabolite of tramadol, produced by liver O-demethylation, shows a higher affinity for opioid receptors than the parent drug. The rate of production of this M1 derivative (O-demethyl tramadol), is influenced by a polymorphic isoenzyme of the debrisoquine-type, cytochrome P450 2D6 (CYP2D6). Nevertheless, this affinity for mu receptors of the CNS remains low, being 6000 times lower than that of morphine. Moreover, and in contrast to other opioids, the analgesic action

of tramadol is only partially inhibited by the opioid antagonist naloxone, which suggests the existence of another mechanism of action. This was demonstrated by the discovery of a monoaminergic activity that inhibits noradrenaline (norepinephrine) and serotonin (5-hydroxytryptamine; 5-HT) reuptake, making a significant contribution to the analgesic action by blocking nociceptive impulses at the spinal level.The incidence of nausea is more common with tramadol than with pethidine or morphine[11].

- **Butorphanol** is a synthetic narcotic given as a 1-2 mg dose which lasts 3 to 4 hours. Neonatal respiratory depression is reported to be less than with pethidine[12].

Patient-Controlled Analgesia

Patient-controlled analgesia with intravenous administration of opioid analgesics was assessed for obstetric pain as early as 1970[13]. The patient's ability to control the analgesic administration may produce pharmacological as well as psychological benefits.Administering analgesics to the patient on demand during pain confers confidence to the patient.

Perineal Infiltration, Pudendal Nerve Block and Paracervical Nerve Block

Perineal infiltration with local anaesthetic solution is of no value for analgesia during labour, but is employed prior to episiotomy just before delivery of the baby.

Pudendal block is a relatively simple, safe and effective method of providing analgesia for spontaneous delivery, normally performed by the

obstetrician. Pudendal block may not provide adequate analgesia for forceps delivery or when delivery requires extensive manipulation. 10ml of local anaesthetic solution (lignocaine 10mg/ml) containing adrenaline is injected, after appropriate aspiration.

Paracervical block serves to relieve the pain of uterine contractions, but because the pudendal nerves are not blocked, additional analgesia is required for delivery. Usually lignocaine is injected at 3 and 9 o'clock. Because these anaesthetics are relatively short acting, paracervical block may have to be repeated during labour. This technique has fallen out of favour because of the high incidence of foetal bradycardia and neonatal depression.

Non-Narcotic Analgesic Techniques for Labour

- **Alpha 2-adrenergic agents**. These drugs have been used as it has been recognized that alpha 2-adrenoceptors can be found in the dorsal horn of the spinal cord and that their activation could produce analgesia.

- The **addition of adrenaline** to local anaesthetic solution intensifies and prolongs the neural blockade.

- **Clonidine** is a more selective alpha 2-agonist than adrenaline. It potentiates the action of spinal opioids. Clonidine does not enhance motor blockade. It does not lead to respiratory depression, pruritis or nausea. It can, however, produce hypotension, bradycardia and sedation after its administration epidurally.

- **N-methyl-D-asparate receptor antagonists**. Receptors for NMDA are thought to play a role in various physiological systems among which their role in enhancing pain transmission ('windup') is now well appreciated.

Because wind-up and hyperalgesia is primarily a spinal cord phenomenon, it appears to be logical to administer NMDA antagonists spinally.

- **Ketamine** has been shown to have analgesic properties in various models. As this drug administered epidurally or intrathecally may not produce respiratory depression, urinary retention or pruritis, its clinical usefulness may be great. Spinal administration of ketamine does not cause motor blockade and arterial blood pressure and heart rate remained unaltered. Drowsiness, dizziness, horizontal nystagmus and dysphoria, however, are the major drawbacks. Recent studies suggest that ketamine may be a useful drug when used in combination.

- **Midazolam** has been demonstrated to have a direct spinal action. Recent studies have focussed on the mechanism of anti-nociception produced by midazolam. The initial step is interaction between midazolam and GABA leading to an increase in chloride flux into the neurone. Through an unknown process, anti-nociception is then produced by activating a system which involves delta-opioid receptors[15]. A study in obstetric anaesthesia has shown that 1mg of intrathecal midazolam injected with bupivacaine at Caesarean delivery reduces post-operative morphine requirements[16].

Effects of pain-relief on labour, mother and foetus/neonate

Pharmacological pain relief in labour is frequently used. Maternal choice of pharmacological methods for analgesia in labour includes not only preferences for the route of drug delivery but also their efficacy and side effects for herself and her baby.

Effects on mother

- **Parenteral Opioids**. The inadequacy of analgesia associated with parenteral opioids is more likely to lead to hyperventilation. This will lead to a lowered maternal $PaCO_2$ that may produce a reduction in utero-placental blood flow. Relative overdose of opioids may lead to hypotension, which is further aggravated by posture and venocaval occlusion. Parenteral opioids cause delayed gastric emptying, which may already have been impeded by labour itself. Furthermore, opioids administered during labour cause nausea and vomiting, from a central action.
- **Paracervical block**. Minor effects such as vertigo, tinnitus and 'aura' have been reported[17]. Transient paraesthesia, numbness and anaesthesia of the leg can occur due to spread of anaesthetic solution to the sacral plexus[18]. Women may be sedated due to partial intravascular injection.
- **Pudendal block**. Unintentional overdosage or intravascular injection can induce dysrrhythmias and cardiovascular collapse. The needle used to place the pudendal block is a source of potential complication as it may unintentionally pierce and damage either the rectum, vagina or foetus. Haematoma in the ischiorectal and paravaginal spaces have been described following pudendal block. The needle may serve as a vector, introducing bacteria into previously sterile spaces; abscess and periosteal infections have been reported in association with pudendal blocks[18, 19].
- **Spinal opioids**. Nausea, vomiting, pruritus and urinary retention can occur with any mu-agonist given by the epidural or subarachnoid route.

Respiratory depression (usually delayed) after subarachnoid and epidural opioid administration is a potentially serious complication. Post dural puncture headache severe enough to keep the patient bed-ridden is undesirable as she needs to take care of the neonate and to be mobilized to prevent thrombo-embolic complications.

- **Epidural analgesia with local analgesic**. Epidural analgesia in labour may be associated with maternal pyrexia and shivering not attributed to infection. The rise in temperature may be secondary to both vascular and thermoregulatory modifications induced by epidural analgesia[20].

Effects on Foetus/Neonate

- Opioids. The immature respiratory centre is more sensitive to the opioid analgesics. Thus, the analgesics cause respiratory depression after crossing the placenta. Opioid analgesics do not tend to have any primary effect on the cardiovascular system of the neonate but may cause bradycardia secondary to opioid-induced respiratory depression.

Pethidine Hydrochloride

Crosses the placenta and its effects on the fetus are dependant on dose and timing of administration; the highest fetal plasma concentration occurs 2-3 h after maternal IM administration. Neonatal effects are compounded by production of nor-meperidine which causes further sedation and respiratory depression. Babies of women administered meperidine in labour have been shown to be sleepier, less attentive and less able to establish breast feeding despite normal apgar scores.

- **Paracervical block**.Transient foetal bradycardia is associated with this technique in a significant number of cases due to direct effects of the local anaesthetic on the foetus as a result of vascular constriction or uterine hyperactivity. Other pharmacological effects of local anaesthetics on the foetal heart are lengthening of the atrioventricular and intraventricular conduction times[21].

Spinal opioids.

Drugs administered to the women are transported rapidly to the uterus and cross the placenta. All commercially available opioids have low molecular weights and rapidly cross the placenta by diffusion.

- **Morphine** - risk of neonatal depression with epidural morphine appears to increase with higher doses and shorter interval between dosing and delivery time because of higher maternal blood levels of morphine[31]. Morphine shares many of the side effects of meperidine and rapidly crosses the placenta, however its metabolites do not have convulsant effects. The dose used for maternal analgesia is 0.1 – 0.5 mg/kg.

- **Fentanyl** - neonatal depression has only been reported with very high repeated epidural doses[22].

- **Alfentanil** - has been associated with neonatal depression[23].

- **Butorphanol** - may be associated with low amplitude, high frequency sinusoidal like foetal heart rate pattern[2]

OPTIMISED LABOUR PROTOCOL

The protocol of optimising labour was the outcome of principles incorporating-Active management of labour,Pain relief provided with a combination of analgesics and antispasmodics, charting events of labour in a partogram .The partogram is a graphical representation alongside a normogram based on data of cervical dilatation-time curve on Indian primigravid women and incorporating Alert and action lines to detect early dysfunctional labour and to be prepared for timely obstetric intervention to optimize labour outcome[25].

The background of programmed labour being traced to O'Driscoll (1970) and the Irish school advocating that prolonged labours predispose to infection, dehydration, ketosis, exhaustion and disillusionment in the mother. Adoption of the policy of "Active management of labour " with the help of amniotomy in active labour and judicious use of prostaglandins and or oxytocin ,along with antispasmodics and analgesics resulted in shorter labours with better obstetric outcome and lowering of the rates of caesarean section.Pain relief provides better environment for labour outcome.

DEFINITION

Programmed labour is an indigenously developed protocol for labour management (Daftary et al 1977, 2001, 2003), developed with the dual objective of providing pain relief during labour and reaching the goals of safe motherhood by optimizing obstetric outcome[26].

Programmed labour concept: The protocol developed by Daftary et al (1992-2001)[26] at the Wadia Maternity Hospital over a period of many years rests on three pillars of:

1. Ensuring adequate uterine contractions—Active management of labour.

2. Providing optimum pain relief—Use of analgesics and antispasmodics.

3. Close clinical monitoring of labour events - Maintaining a **PARTOGRAM.**

All patients included in this study satisfied the below mentioned selection criteria:

1. Age between 21-30 years.

2. No identifiable medical or obstetric complications present.

3. Admission Non Stress Test-satisfactory.

4. Patient counselled and consent taken.

5. All observations made by above mentioned clinicians.

Admission Criteria—Programmed Labour

The medication protocol for programmed labour begins only after the patient enters the *Active Phase* of labour. The starting point of active phase of labour is identified on the basis of clinical evaluation, when the following parameters are satisfied:

- The cervical dilatation is 3.0 cm or more, and the cervical effacement is > 50%.
- The uterine contractions come at a frequency of at least 3 in10 minutes and lasting for 35-45 seconds.
- The head should be engaged.
- There should be no clinical suspicion of CPD.
- The patient may have show or draining.

Medications used in programmed labour: As per this protocol—a combination of drugs are used to provide effective pain relief (labour analgesia), coupled with antispasmodic drugs which help in cervical softening, yielding and dilatation to moderate driving forces. This policy provides with the benefits of drug synergism whilst at the same time restricting the doses of drugs to minimal amounts commensurate with achieving progressive labour whilst at the same time safeguarding the mother and her foetus against any major drug adverse effects.

PROGRAMMED LABOUR

- Start an intravenous infusion line with 5% Ringer Lactate solution with about 20 drops/min.
- Ensure that the pains are optimal, i.e. 3-4 sustained pains/10 minutes. If necessary, you may add 2 units of Oxytocin to the drip or give a tablet of Primiprost orally every hour to ensure optimal pains resulting in progressive labour.

- Dilute an ampoule of 30 mg. Pentazocine or Fortwin with a diluent like normal saline/distilled water, and similarly dilute an ampoule of diazepam in 10 ml of diluent. Administer 1/5 of each drug, i.e. 6.0 mg of Fortwin and 2.0 mg of diazepam, slowly in bolus form through the tubing of the infusion line (Ganla et al 2000, Guseck 1952)[27, 28].

Administer Injection Tramadol in the dose of 1 mg/kg body weight Intramuscularly, along with an antispasmodic Injection Drotaverine 40 mg, (other alternatives include Inj. Anafortan, Buscopan, or Epidosin), as per clinician's choice-(Etterich 1959, Khosla et al 2003, Mishra et al 2002 (Mukhopadhyaya et al 2000)[29,30,31,32].

Observe the progress of labour by charting the maternal and fetal parameters every hour or earlier if indicated, and assess the progress of labour on the basis of cervical dilatation and descent of the fetal head, as documented periodically on the partogram.

When the patient is in advanced labour, and the fetal head pressing down on the pelvic floor, the patient starts complaining of severe pain, or bearing down sensation. At this time the cervix is often almost 7-8 cm dilated. This is the time to administer Injection Ketamine if required, in the following manner (Ganla et al 2000)[27].

Initial dose: Injection Ketamine 0.25 mg to 0.5/kg body weight. Dilute the drug in 10 ml of saline, and administer slowly through the tubing of the infusion line as

a bolus over a period of a few minutes until the desired effect is obtained. Often a small dose of 0.25 mg/kg or less suffices. Do not exceed the maximum dose.

For a patient weighing 60 kg. The initial Ketamine dose works out at 15-30 mg. All subsequent top-up doses of Ketamine are given at 20-30 min intervals. These top-up doses are half of the initial dose, i.e. 7.5-15 mg in the patient weighing 60 kg.

The last top-up dose of ketamine should be given after the birth of the baby. This will relax the patient, and allow satisfactory inspection of the Vulva, Vagina, and Cervix to exclude traumatic injuries requiring repair.

MANAGEMENT OF THIRD STAGE OF LABOUR

This is the treacherous and unpredictable part of labour. To shorten the duration of the third stage, minimize blood loss, ensure sustained uterine contraction, and obviate entrapment of the placenta.The following options in the management of the third stage of labour.

1. Inject Injection Prostaglandin F2 alpha 125 mcg IM after the birth of the baby.

or

2. Inject 10 units of Oxytocin diluted in 20 ml saline through the umbilical vein of the placenta. OR administer it slow intravenous to the mother. The above suggested regime of programmed labour yields.

The following advantages:

- Shorter labours with substantial pain relief.
- Significant amnesia of painful events of labour.
- Significant reduction of dystocia.
- Lowering of the incidence of operative deliveries.
- Obstetric management simplified.
- Short duration of third stage of labour.
- Minimal blood loss after delivery.

Pharmacology of Drugs used in the protocol

The drugs used in the protocol

DRUG	DOSE	ONSET	DURATION	ADVERSE EFFECTS	ANY OTHER
Tramadol	1-2mg per kg IM or slow IV	10-15mins IM	2-3hrs	Nausea, vomiting, Giddiness, rapid iv bolus can cause seizures, Has less sedation And respiratory depression compared to other opioids.	
Pentazocine	20-40mg IV/IM	2-3mins IV, 5-20mins IM	2-3hrs	Causes dysphoria, tachycardia And hypertensive response, opioid agonist/antagonist.	
Ketamine	0.25 to o.5mg /kg IV in 10 ml saline	10-20 sec	10-30 min	Respiratory depression , Hallucination	
Diazepam	0.2-0.3 mg/kg	1-5 min	15min to 1 hr	Hypotension , Reflux tachycardia, Respiratory	
Drotaverine	40-80 mg /dose IM	1 hr	5 to 7 hrs	Dizziness, Headache, Nausea, Palpitation, Constipation, Insomnia, Hypotension.	

REVIEW OF LITERATURE

Programmed labour protocol leads to mitigation of excruciating pain of labour, facilitation of cervical dilatation and reduction in incidence of dysfunctional labour as supported by following studies.

Programmed labour- an Indigenous protocol to optimize labour outcome by Shirish N Daftary et al (2009) was a pioneer study to assess the protocol to optimize labour outcome[26].

The study group included 200 low risk primigravida aged between 21-30. The outcome parameters were satisfactory labour outcome, progressive labour of shorter duration, less blood loss and pain relief.

The results had mean shorter duration of active labour as 3.5 hrs compared to controls of 5.2 hrs. Excellent pain relief was of 24% and 62% of substantial relief in comparison to 32% only in other group ,with no patient falling in excellent group. Second stage of labour was reduced by half (26 to 48 minutes) and comfortable labours with lesser blood loss.

The conclusion was programmed labour with indigenous protocol developed and practiced, results in progressive, shorter and comfortable labours with lesser blood loss.

A clinical study *" To evaluate the various effects of programmed labour protocol on normal nulliparas and their neonates" by Meena Jyothi, Singhal Prabha et al*[33] , Showed a reduction in duration of First, second and third stage

of labour. The average blood loss was reduced significantly in the study group compared to the control group. Ninety -eight percent of the subjects and 94% of the controls delivered normally vaginally, 2% of the subjects and 2% of the controls needed forceps application and 4% of the controls had ventouse extraction. Mean APGAR score was above 7 in both the groups at 1 and 5 minutes.

Thus programming of labour is simple, easy and effective method for painless and safe delivery. The analgesia produced is quite effective and overall duration of labour is significantly reduced. Blood loss in third stage is also significantly reduced. Maternal side effects are minor without any fetal or neonatal respiratory depression.

A clinical study *"To evaluate the efficacy of Programmed Labour protocol in providing shorter, safer and a relatively pain free delivery " by Veronica Irene Yuel, Vaneet Kaur, Dilpreet Kaur et al*[34] The mean rate of cervical dilatation in the study group was 2.3cm/hr, which was almost double than the control group. There was marked shortening of all the stages of labour. Average blood loss was comparatively less in the study group. 70% of women in the study group had significant pain relief. Majority of women in the study group delivered vaginally.Programmed labour protocol can safely lead to shorter labour and significant pain relief without any major increase in maternal or neonatal morbidity.

Tramadol has been found to be an effective analgesia in labour without having a deleterious effect on the mother and the fetus. The incorporation of partogram into the protocol of programmed labour helped to eliminate the ill effects of prolonged labours, prompted earlier recognition of dystocia and implementation of measures at the same time.

"Optimizing Labour Protocol" or "Programmed Labour Protocol" leads to shorter labours; analgesia is quite effective and side effects of drugs are minimal and safe for the fetus as well; labour is cherished with pleasure and childbirth becomes a joyous event for the mother.[34]

A clinical study "*To compare the efficacy and safety of drotaverine hydrochloride and valethamate bromide in shortening the duration of labour"* by J. B. Sharma, P. Pundir et al[35] showed that - the rate of cervical dilation was highest in the drotaverine group (2.04 cm/h) compared with the valethamate bromide group (1.86 cm/h) and control group (1.01 cm/h). There were no major maternal or fetal adverse effects in any group, but minor side effects were more common in the valethamate group. Conclusion of the study was that both intravenous drotaverine hydrochloride and valethamate bromide are effective in acceleration of labour; however, drotaverine accelerates labour more rapidly and is associated with less side effects.[35]

"A comparison of tramadol and pethidine analgesia on the duration of labour", a randomised clinical trial by Maryam Khooshideh and Ali Shahriari[36]

Aim of the study was to compare the outcome of intramuscular administration of Pethidine and Tramadol in labour analgesia. Primary outcome measure was the duration of the labour. The analgesic efficacy, maternal side-effects, mode of delivery, maternal satisfaction and APGAR score as the secondary outcome were assessed.Both 100 mg tramadol and 50 mg pethidine provide moderate analgesia in first stage of labour. Tramadol seems to cause a shorter duration of labour and lower incidence of maternal side-effects. However, its analgesic efficacy was not found to be as effective as pethidine, especially in the second stage of labour.[36] In Programmed labour protocol , to optimize pain relief and facilitate cervical dilatation , at the onset of active phase of labour 6 mg of Pentazocine and 2mg Diazepam diluted in 10 ml of distilled water is injected slow I/V as a bolus dose . Injection Tramadol in dose of 1mg/kg body weight is given I/M. Then injection Drotaverine hydrochloride or Valethamate bromide is given slow I/V. Drotaverine is repeated after 3-4 hrs if required , Valethamate bromide is given every hourly for 3-4 doses. Active management of third stage of labour is done by administering PGF2 α 125 microgram deep I/M after the birth of the baby. The duration of labour is much curtailed, the obstetric intervention is not increased, and neonatal outcome is satisfactory without perinatal loss .[37]

MATERIALS AND METHODS

This is a hospital based randomised prospective clinical study. Two Hundred Term Primigravidae at term, with no high risk factors who are in active phase of labour are included in the study.

Study Duration: 1 year (September 2010 – 2011)

PLACE: INSTITUTE OF SOCIAL OBSTETRICS & GOVERNMENT KASTURBA GANDHI HOSPITAL

Inclusion Criteria:

Term Primigravidae at term with cephalic presentation, adequate liquor and no high risk factors and in active phase of first stage of labour with cervical dilatation 4cm and intact membranes, Reactive Admission Test were taken into the study

Exclusion Criteria

1. Teenage pregnancies and Elderly Primi
2. Cephalopelvic disproportion present.
3. Malpresentations
4. Ante partum Haemorrhage
5. Evidence of IUGR,Oligoamnios
6. Multiple pregnancies
7. Medical illness like Diabetes mellitus, Bronchial Asthma, Hypertension, Cardiac disease, Liver diseases.

Method: This is a Hospital based prospective randomized study to evaluate the Programmed labour protocol and its outcome in term Primigravidae with no high risk factors.Ethical committee clearance obtained.

Two Hundred Primigravidae of 37 to 41 weeks gestational age with cephalic presentation and no cephalo-pelvic disproportion, and in active phase of labour with cervical dilatation of 3-4 cm and good cervical effacement were included in the study. All the patients were explained in detail about the protocol, drugs used and the effects. Those who have given the informed consent were included as study group and others were taken as control group. None should have clinical evidence of cephalopelvic disproportion, or history of medical disorders like Hypertension, Cardiac disease, Bronchial asthma, Diabetes, Jaundice.

Study group and the Control group.

The study group consists of 100 primigravid women, who received Programmed labour protocol, while the control group of 100 primigravidae were managed expectantly and had spontaneous progression of labour.On admission to the labour ward,patients were reviewed with a Detailed history, General examination, Systemic examination and Obstetric examination including vaginal examination was performed.A detailed information of the study and the protocol was informed to the patient. Written informed consent for inclusion in the study is obtained. The study was done in collaboration with pediatrician and anesthetists of our institution.

The patient was taken up for programmed labour after she enters the active phase of first stage of labour. From this point onwards all events of the course of labour are documented on a partogram and labour is monitored.

Partography denotes the graphical representation of cervical dilatation on a time scale. Friedman (1955, 1967)introduced the now well-known S-shaped or sigmoid curve representing the Mean Cervical Dilatation-Time curve of labour,this forms the basis of partograms commonly used for Labour-Documentation. Studd (1973) demonstrated the importance of utilizing the normograms based on the mean cervical dilatation time curve of normal primigravidae and multiparae in any ethnic population as the basis for comparing the labour progress in any parturient during labour. The patient's partogram is charted alongside the standard 'normogram'.

Use of partograph, first introduced by Philpott and Castle in 1972 in Harare has established the benefit of active labour[38]. The world health organization has published series of monographs on the use of partogram to prevent prolonged labour. WHO had recommended use of oxytocin only after reaching the action line on the partogram. Use of partogram significantly reduced the operative delivery rate duration of labour and perinatal mortality & morbidity.

All medications will follow a preconceived and accepted protocol of drug medication. An IV infusion line using Ringer Lactate solution to prevent maternal exhaustion and ketosis was started.

In study group amniotomy was performed at 3-4 cms dilatation to ensure presence of clear liquor and satisfactory fetal heart rate pattern.

For the adequacy of uterine contractions , labour is augmented with Oxytocin infusion 5 units in 500 ml of Ringer lactate started at 10 drops/min in escalating doses till at least 3 contractions in 10 minutes , lasting 35-45 seconds is achieved.

At 3-4 cm of cervical dilatation, Injection Pentozocine 6 mg diluted with 10 ml distilled water and and Injection Diazepam 2 mg diluted with 10 ml distilled water was taken.

Administering 1/5 of each drug (i.e. Injection Pentozocine 6 mg and Injection diazepam 2 mg) slowly intravenous with monitoring of pulse rate, blood pressure and oxygen saturation to initiated pain relief. Then Injection Tramadol 50 mg intramuscularly was administered in thin patients ,after 30 minutes. If patient's weight is over 60 kg the dose is to be increased to 1.0 mg/kg maternal body weight.

Along with Tramadol, Injection Drotaverine 40 mg is administered intravenously and can be repeated every 2 hours, if required, for a maximum of three doses.

Maternal pulse rate, blood pressure, temperature noted half hourly, along with oxygen saturation monitoring by pulse oximetry was done.

The combined drug effect provides excellent pain relief and cervical dilatation. The fetal heart rate and uterine contractions are closely monitored, and the rate of infusion escalated up to optimal 3 or more contractions lasting for 45 seconds. A maximum dose of 60 drops per minute i.e 20 mu.per minute was used. The progress of labour is satisfactory, when the cervical dilatation is of 2 - 2.5 cm/hour. If progress is unsatisfactory after 4 hrs of augmentation, cephalo-pelvic disproportion is reassessed. The diagnosis of cephalo pelvic disproportion is made if there is caput ,moulding and poor cervical dilatation. If there is no sign of moulding and poor cervical dilatation is present, slow progress of labour with secondary arrest of dilatation is diagnosed and Caesarean section performed.

Oxytocin infusion was discontinued, if any fetal heart variability is observed or meconium stained liquor is present and fetal distress was diagnosed and Caesarean section performed.

When the patient is in the advanced second stage, and the fetal head starts pressing down on the pelvic floor, the patient complains of severe bearing down pains. Now Injection Ketamine 0.25mg/kg body weight diluted in 10 ml of saline, is administered slowly in the tubing of the infusion line as a bolus, until patient has pain relief. The initial Ketamine dose is 15-30 mg. The next dose was planned only after a 30 min interval if patient complains of pain and when planned for operative vaginal delivery. The next dose if needed was 7.5 mg, which was slowly through the tubing of the infusion line. The patient is monitored with pulse rate, blood pressure, level of consciousness and oxygen saturation.

The baby was delivered under aseptic precautions, giving episiotomy if necessary. If the patient failed to strain, with head at +3 station, we employed outlet forceps or ventouse delivery. These patients if they complained of pain, were given an extra dose of Injection.Ketamine 7.5mg given, additionally.

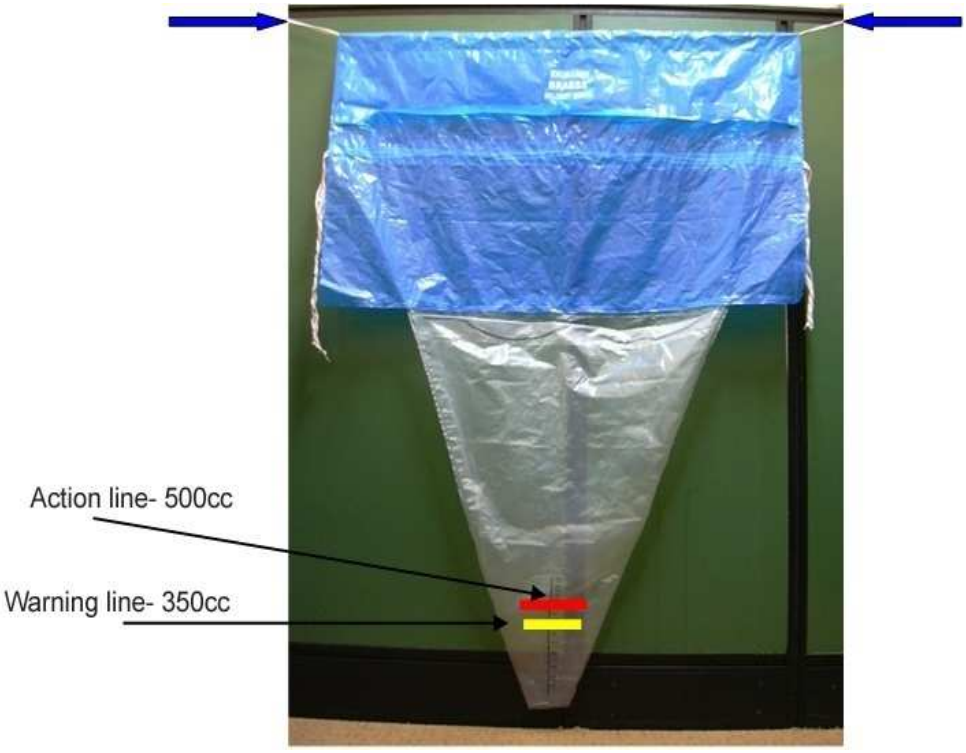
Active management of third stage of labour (AMTSL) was carried,

- Injecting PGF2alpha 125 microgm intramuscularly within 1minute of delivering the baby.
- Controlled cord traction
- Early clamping and cutting the cord

Partogram was plotted for the progress of labour, rate of cervical dilatation, duration of active phase of labour, second stage of labour,number of contractions, fetal heart rate, I/V fluids, Medications used etc. It serves as the control baseline reference for all further evaluation of treatment regimes.

Pain Relief Score in the study and control group was noted in postpartum after they were fully awake with the help of verbal numeric pain intensity scale which is marked from 0 to 10

Average blood loss was assessed with the by **Blood collection drape.**



The outcome of programmed labour protocol is assessed with respect to

1. Mean rate of cervical dilatation
2. Mean duration of Active phase of labour
3. Mean duration of Second stage of labour
4. Mean duration of Third stage of labour
5. Average blood loss
6. Pain relief in labour
7. Mode of delivery
8. APGAR scores

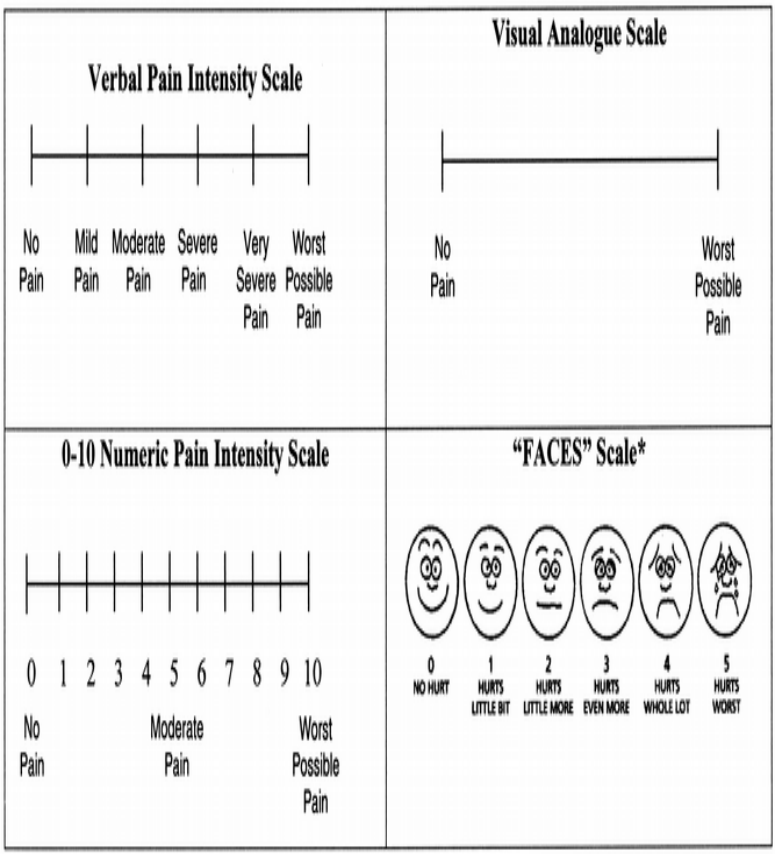
All the above parameters were compared between the study and control groups and appropriate statistical analysis was done by using Chi-Square test , Fisher's exact test and paired 't ' test .

Investigations done:

- Haemoglobin
- Blood group and Rh type
- Random blood sugar
- HIV
- HBs Ag
- VDRL
- Urine Albumin / sugar
- Ultrasonogram
- Admission cardio-tocography.

Pain Score

Pain scoring been assessed in so many ways in both subjective and objective manner. Verbal analogue scoring system is one of the pain scoring systems commonly applied worldwide. Visual analogue scale is a simple assessment tool consisting of a 10 cm line with zero on one end and 10 on the other end with gradual increasing severity of pain nature.



Visual Numeric Rating Scale

- Good relief 0 - 3
- Moderate relief 4 - 6
- Mild relief 7 - 8
- No relief 9 – 10

RESULTS

This study was conducted in Institute of Social Obstetrics and Govt Kasturba Gandhi Hospital during the period September 2010-2011.The study was a prospective randomized study in 200 low risk primigravidae.The study group consisted of 100 patients who received optimized labour protocol and 100 control group who were allowed for spontaneous progression of labour. The study commenced at the start of the active phase of labour, followed by plotting the events of various stages of labour and the drugs given, partographically.

The study and control group were compared for age, physical characteristics, and gestational age.

COMPARISON OF THE DEMOGRAPHIC PROFILE BETWEEN THE STUDY AND CONTROL GROUPS:

Parameters	Study (n=100)	Control(n=100)
Maternal age (Mean age in years)	24.19	24.98
Height (Mean height in cm)	155	154.5
Weight (Mean weight in kgs)	62.5	62
Gestational Age (Mean GA in wks)	39	39
Estimated fetal weight in kgs	2.7	2.75
Cervical dilatation on admission in cm	4	4

All the results were statistically analysed with Chi-Square test, Fisher's exact test and paired 't ' test and evaluated for statistical significance.

Comparison between the age in the study and control groups

Age in yrs	Study group n = 100	Control group n = 100
20 -25 yrs	56	54
26 -29yrs	44	46

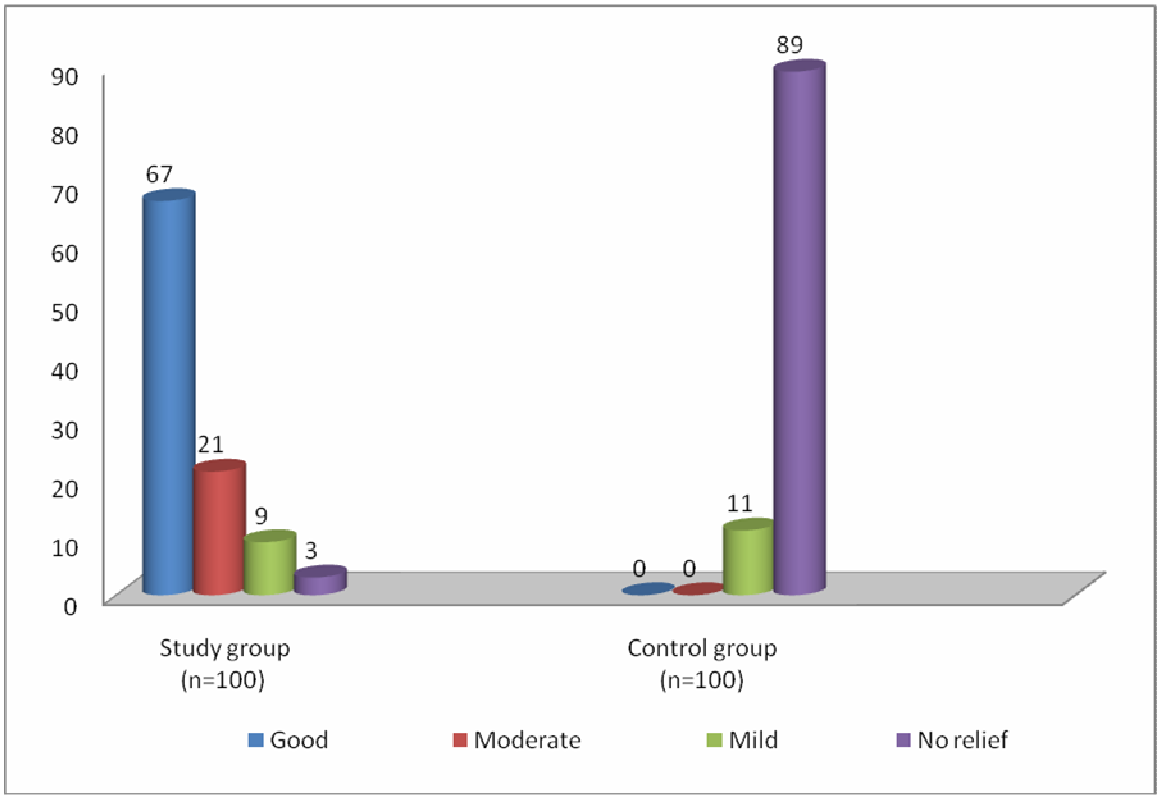
- So most of the cases & controls were in the 20-25yrs age group & mean gestational age was 39 wks.

Degree of Pain Relief

Pain Score (VAN scale)	Study Group (n=100)	Control Group (n=100)
Good relief 0 - 3	67	0
Moderate relief 4 - 6	21	0
Mild relief 7 - 8	9	11
No relief 9 - 10	3	89

- Thus 88% has moderate to good relief of pain among the cases, while all the controls had mild to no relief of pain.
- Degree of Pain relief was analyzed with Fishers exact test and *'P' value < 0.0001 and the association is statistically significant.*

Comparison of pain relief b/w in study and control groups



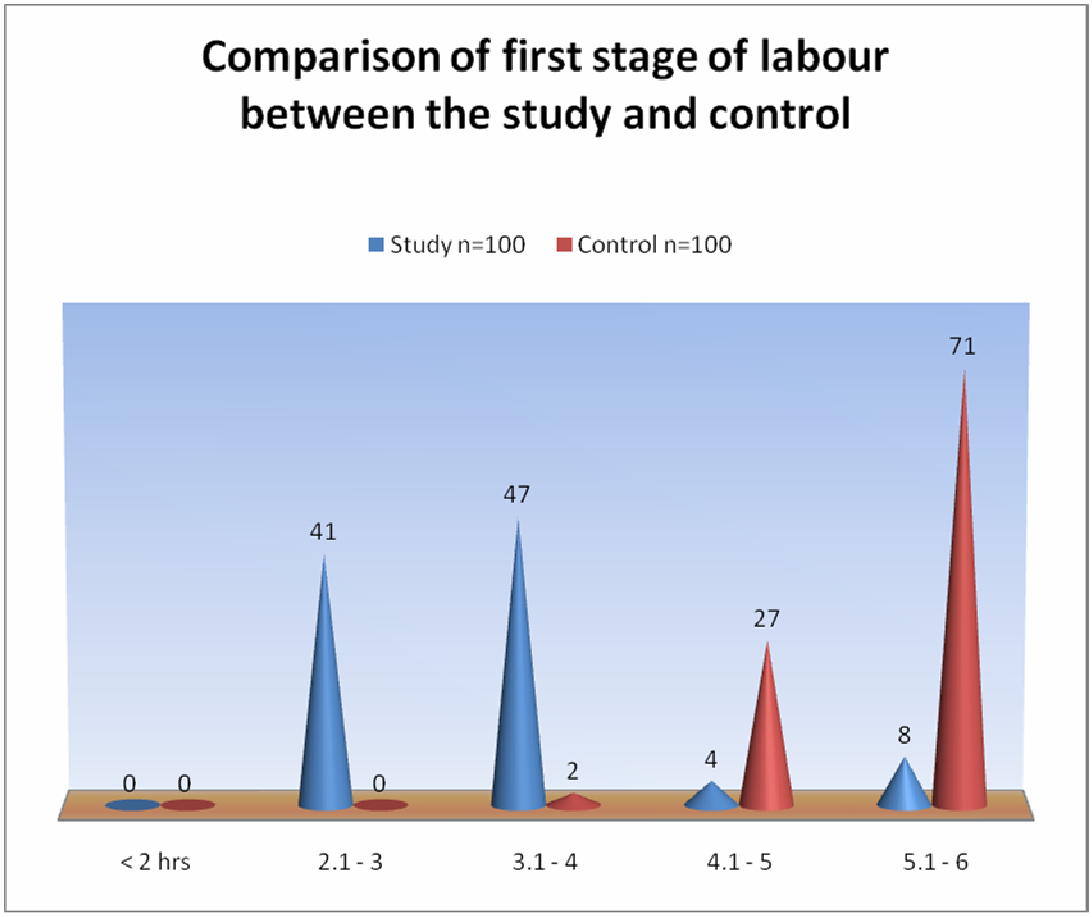
Duration of active phase of labour in 1st stage

Time in hrs	**Study n=100**	**Control n=100**
< 2	0	0
2.1 - 3	41	0
3.1 - 4	47	2
4.1 - 5	4	27
5.1 - 6	8	71

Thus 88 % of study completed their 1st stage (from 4cm) within 4hrs &98% of control took > 4hrs.

	Study	Control
Mean	3.285	4.957
Std deviation	0.733	0.443
SEM	0.073	0.044
N	100	100

Paired t test was done,t value=18.4913 and two tailed p value is less than 0.0001 and the difference is statistically significant.

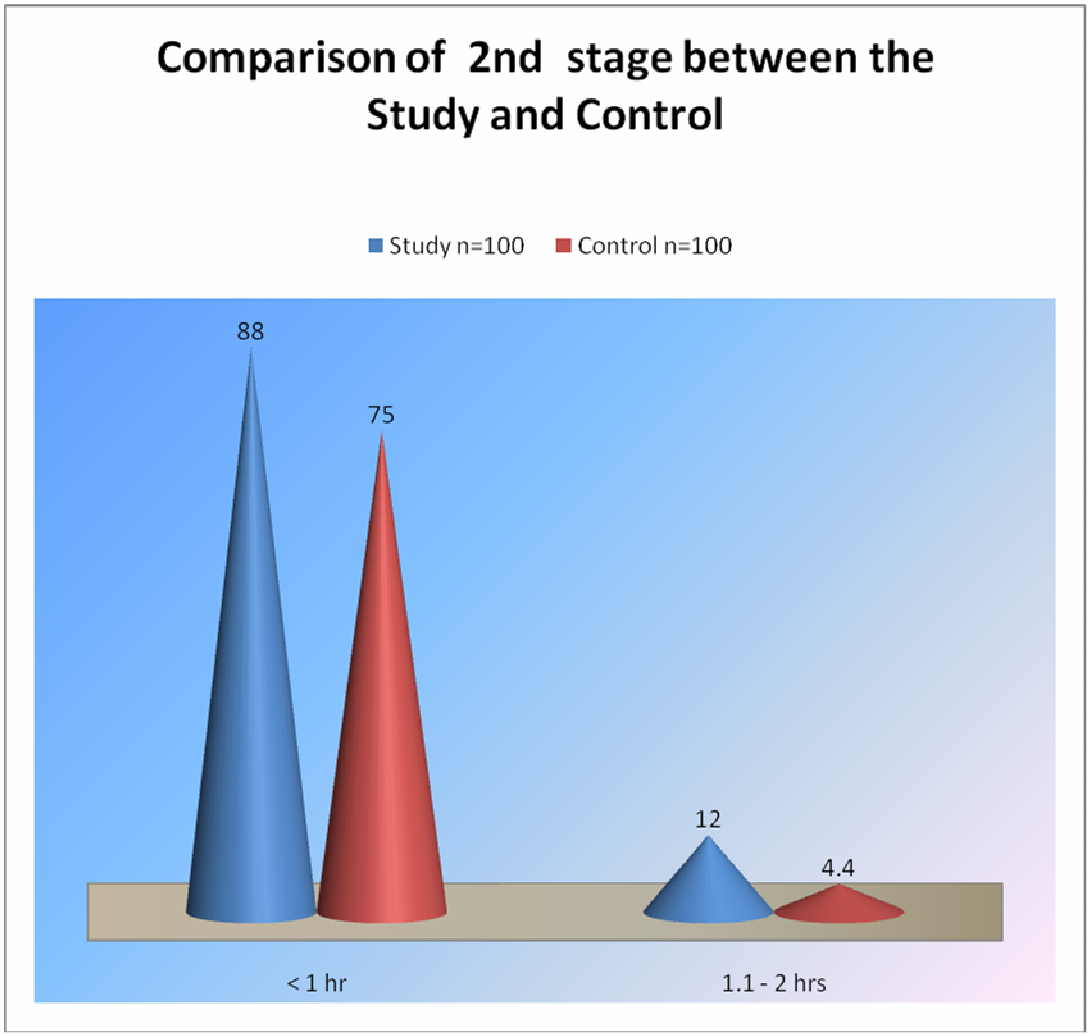

Comparison of first stage of labour between the study and control
Study n=100
Control n=100
0
0
41
0
47
2
4
27
8
71
< 2 hrs
2.1 - 3
3.1 - 4
4.1 - 5
5.1 - 6

Duration of 2nd Stage of Labour

Time In hrs	Study Cases (n=100)	Control cases (n=100)
<= 1	88	75
1.1 – 2 hrs	12	25

- Paired t test was done, t value=7.0901, and the two tailed p value is less than 0.0001 and the difference is statistically significant.

	Study	Control
Mean	41.60	58.67
Std deviation	9.04	21.04
SEM	0.90	2.10

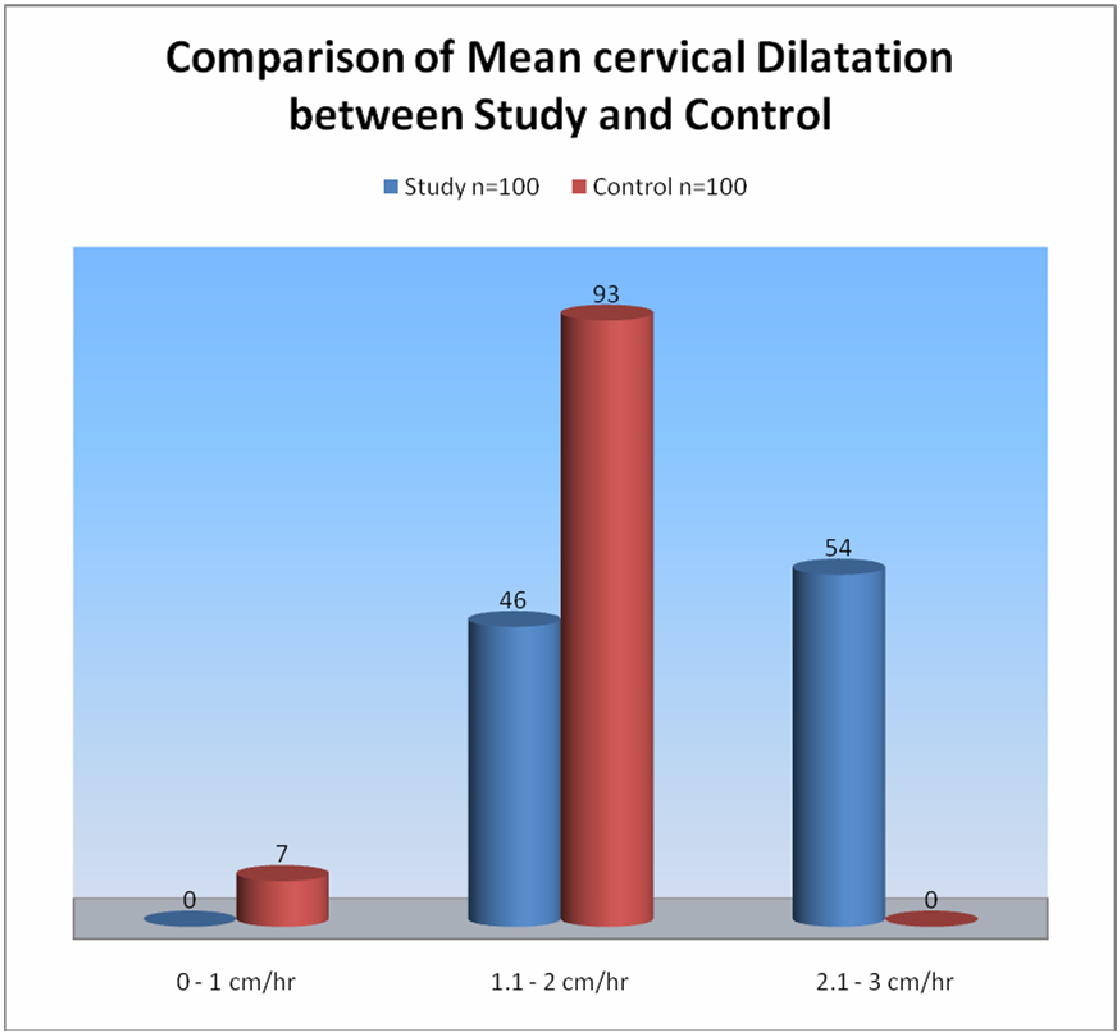

Comparison of 2nd stage between the Study and Control
Study n=100
Control n=100
88
75
12
4.4
< 1 hr
1.1 - 2 hrs

Comparison of Mean cervical Dilatation between Study and Control Groups

CERVICAL DILATATION in cm	STUDY [n=100]	CONTROL [n =100]
0-1cm/hr	0	7
1.1-2 cm /hr	46	93
2.1-3 cm/hr	54	0

Paired t test was done value=17.3122, two tailed p value is less than 0.0001 and the difference is statistically significant.

	Study	Control
Mean	2.034	1.284
Std deviation	0.353	0.186
SEM	0.035	0.019


Comparison of Mean cervical Dilatation between Study and Control
Study n=100
Control n=100
0
7
46
93
54
0
0 - 1 cm/hr
1.1 - 2 cm/hr
2.1 - 3 cm/hr

The comparison of the duration of the third stage of labour, showed a mean of 4.371mins in the study group and 6.494 mins in the study group. Paired t test was done, t value=13.3219 and the two tailed p value is less than 0.0001 and is statistically significant.

The average blood loss in the study group is 123ml and 175.85ml in the control group. Comparison between the study and the control group was done by Paired t test. and the t value=15.8075 and the two tailed p value is less than 0.0001 and is statistically significant.

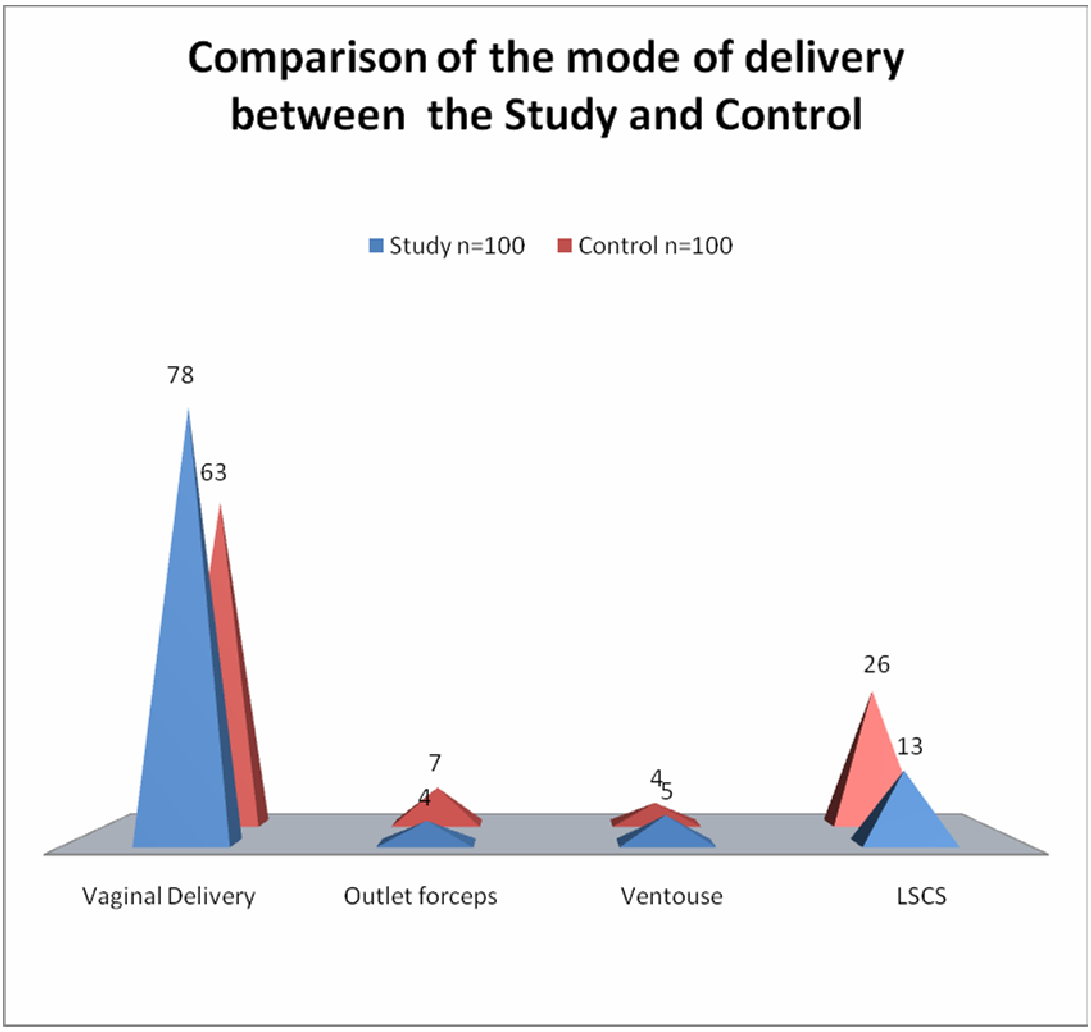
COMPARISON OF THE MAIN OUTCOMES OF THE STUDY:

Parameters	Study group	Control Group	"P"value (Fishers exact test-two tailed,Paired t test)
Mean rate of cervical dilatation cm/hr	2.034	1.284	< 0.0001
Mean duration of 1st stage of labour in hrs	3.285	4.957	<0.0001
Mean stage of 2nd stage of labour in mins	42	59.07	<0.0001
Mean stage of 3rd stage of labour in mins	4.371	6.494	<0.0001
Pain relief in labour Good to Moderate Poor to No relief	 88 12	 4 96	<0.0001
Average blood loss	123 ml	175.85ml	<0.0001
APGAR score 0-3 4-6 7-10	 0 0 100	 0 3 97	

Comparison of the Mode of Delivery B/W Cases & Control

Mode of delivery	**STUDY(n=100)**	**CONTROL(n=100)**
Vaginal delivery	78	**63**
Outlet forceps	**4**	7
Ventouse	**5**	**4**
LSCS	**13**	**26**

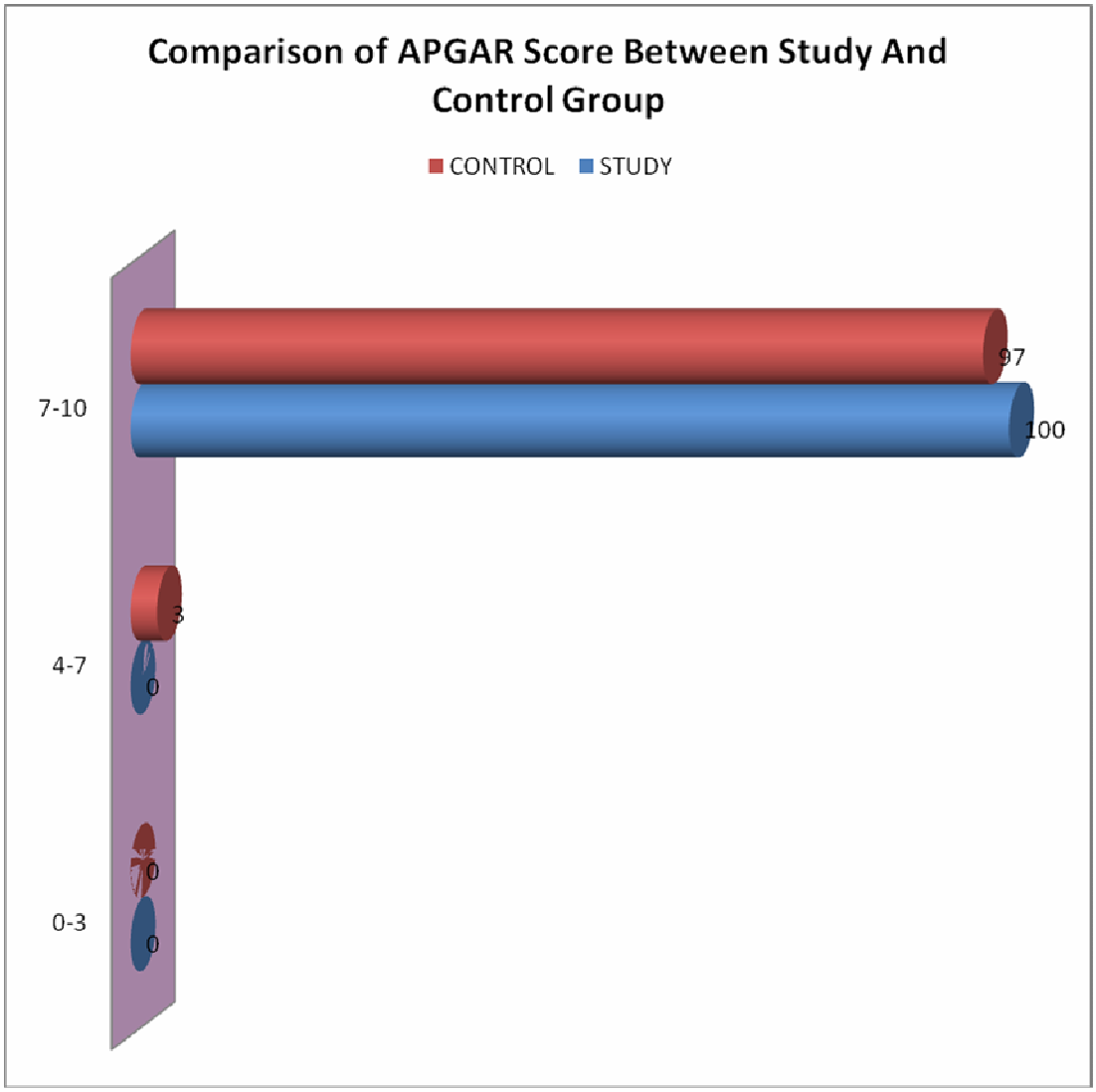
Comparison between the mode of delivery, Fishers exact test was done and the two tailed p value is 0.0313 and statistically significant.


Comparison of the mode of delivery between the Study and Control
Study n=100
Control n=100
78
63
7
4
4
5
26
13
Vaginal Delivery
Outlet forceps
Ventouse
LSCS

In the study group , in the APGAR scores of all the neonates were 7-10, without being much affected by the analgesics used , The apgar scores of 3 neonates in the control group was 4-7 who were taken up for emergency LSCS for fetal distress. The neonates required NICU admission for 1day for observation after which they showed good prognosis .

COMPARISON OF APGAR SCORE BETWEEN STUDY AND CONTROL GROUP

APGAR SCORE	**STUDY**	**C**ONTROL
0-3	**0**	0
4-7	0	3
7-10	**100**	97


Comparison of APGAR Score Between Study And Control Group
CONTROL
STUDY
7-10
4-7
0-3
97
100
3
0
0
0

DISCUSSION

Preventing prolonged labour is the key strategy for reducing maternal and neonatal morbidity. Providing pain relief in low resource settings with analgesics holds potential in the future to be a universal protocol.

In my study, most of the parturient had reported that the pain relief was adequate and the quality of analgesia was superior at a dose with minimal maternal hemodynamic instability. This finding was consistently similar to the carried out by Shirish N Daftary et al[26].

In my study, most of the study and controls were in the 20-25 yrs age group & mean gestational age was 39 wks.

88 patients had moderate to good relief of pain among the study group and 94 patients of controls had mild to no relief of pain.

88% of cases completed their 1st stage (from 4cm) within 4 hrs & 98% of controls took > 4 hrs in primi

41 patients of the study group completed their first stage within 3 hours and 47 patients within 4 hours where as 4 patients by 5 hours, while 8 patients took 6hrs to complete the active phase of I stage. Thus 88 cases completed their first stage within 4 hours alongside a normogram of 5 to 6 hours.

The mean rate of cervical dilatation was 2.034cm/hr as compared to the control group. In the study group 88 patients completed their second stage of labour within one hour and 12 cases within two hours

There were total of 78 patients who delivered vaginally. 9 cases had operative vaginal delivery for failure of secondary maternal forces and fetal distress. 13 cases underwent LSCS of which 6 were done for indication of Fetal Distress, 3 for Cephalo - pelvic disproportion, 2 for secondary arrest of labour and 2 for Persistent ROP.

The mean duration of 3rd stage of labour was 4.37 minutes.

The mean blood loss was 123ml by blood collection drape and average mop count.

In the expectant group only 2 patients completed their first stage within 4 hours, 27 cases within 5 hrs and 71 patients within 6 hrs.

75 patients completed their second stage within 1 hour and 25 cases completed the same in 2 hours.

63 patients had vaginal delivery and a total of 11 patients had operative vaginal delivery. 26 patients underwent cesarean section of which 12 patients for the indication of fetal distress, 7 patients for Prolonged II stage, 1 for uterine dystocia , 3 patients for Cephalo pelvic disproportion, and 3 for secondary arrest of labour.

The mean cervical dilatation was 1.284 cm / hour in the expectant group. The average blood loss was 175.85 ml by blood collection drape and average mop count. There were 3 patients of mild atonic PPH in the expectant group who were treated as emergency with injection PGF2 – alpha 250 micro gram intra muscularly and tablet PGE1 - 1200 microgram per rectally and maintenance with Oxytocin 20 units in an intra venous infusion.

There was difference between the two groups in the APGAR score at 1 and 5 minutes. In the study group all the babies had a favorable APGAR at 1 and 5 minutes. In the control group poor APGAR of 4 – 6 was found in 3 cases taken up for Emergency LSCS for indication Fetal distress.They were in NICU admission for 1 day and showed good prognosis.

Total number of vaginal deliveries (S = 78 & E = 63) was higher in the study group and lesser number of cesarean sections (S = 13 & E = 26) was also observed in the study group. Incidence of operative delivery (S = 9 & E = 11) was higher in the control group as against the study group mainly due to arrest of descent in the 2^{nd} stage which attributed mostly due to maternal fatigue , dehydration and inability to bear down in the 2^{nd} stage as a consequence of prolonged labour than the study group.

Cardozo's[39] study and study of **Li BQ et al**[40] showed similarity with this study,The total duration of labour was less than 5 hours in the study group compared to an average total duration of 7.2 hours in the expectant group.

Kustagi et al (1989) and cohort study by **Chanrachakul et al (1991-1998)**[41] revealed the length of labour was significantly shortened with early use of oxytocin. Prolonged and obstructed labour are still prevalent in the developing world and responsible for majority of rupture uterus, vesico-vaginal fistula and other maternal morbidity .

Primary cesarean births accounted for 50% of the increasing cesarean rate among primary cesarean deliveries more subjective indications (non reassuring fetal status and arrest of dilation) contributed larger proportions than more objective indications (Malpresentations , maternal-fetal and obstetric conditions) [42]

We can reduce these indications to a minimum by the implementation of optimized labour protocol judiciously.

Thus the study group of 100 primi gravida had shorter, relatively painless labour and shorter hospital stay.

SUMMARY

The current study was conducted at ISO & KGH, during the period from September 2010-2011 as a prospective randomized study to evaluate the efficacy of programmed labor protocol, two hundred low risk primigravidae with no medical risk factors, and no cephalo-pelvic disproportion in active phase of labour was included,in a population with similar demographic profile. The study group received the programmed labour protocol while the control group was expectantly manage

The aim of the study was to analyze the key events of labour,

- Mean Duration Of First Stage Of Labour
- Mean Duration Of Second Stage Of Labour
- Mean Duration Of Third Stage Labour
- Mean Cervical Dilatation
- Estimation of blood loss in the third stage.
- **APGAR** score

In the current study, we observed that the

Total duration of labour was reduced by 1.3 hours compared between the study and control (S= 4.105 E= 5.547)

The mean duration of first stage of labour was reduced in the study group as compared to the control group by 1.572 hours (S =3.285 , E=4.957)

The Mean duration of second stage of labour was 42 minutes which was 17.07 minutes less than the duration in the control group.(S=42, E=59.07).

The Mean duration of third stage was reduced in the study group as compared to the expectant group (S=4.371 minutes E =6.494 minutes).

The mean cervical dilatation was accelerated in the study group by 0.75cm/hour(S=2.034; E=1.284)

There was reduction in average blood loss (S=123 ml; E= 175.85 ml) estimated by blood collection drape which showed 52.85 ml decrease in the control group.

The improved labour outcome in terms of increased number of normal vaginal delivery(S= 78; E =63)

Assisted vaginal delivery (S= 9 E=11)

Lower segment caesarean section (S=13 E=26)

All the babies show good APGAR scores (7-10) in the study group versus the control group, which was beneficial.3 neonates in the control had APGAR scores of (4-7), who were neonates of patients taken up for LSCS with indication of Fetal distress. The neonates were followed in the post natal period and they showed good prognosis.

The quality of labour analgesia was superior with pain relief scores of (good -moderate 88%) in the study group as compared with no relief in the control

group ,at a dose with simple analgesic and anesthetic drugs available at peripheral set up, with minimal maternal hemodynamic instability. There were only minor adverse effects like nausea, giddiness and drowsiness in 18patients. The analgesic effect had no impact on the patients taken up for LSCS.

The reduction in primary caesarean section rate (S=13; E=26) by 50% was an advantage to the obstetrician.

The shorter labour shorter hospital stay reduction in blood loss, relatively painless labour will surely be a pleasant experience to the patient.

Hence in the current study, we concluded that efficacy of optimized labour protocol is superior without imposing any significant impact on the maternal hemodynamics and the fetal outcome.

Furthermore the reduction in primary cesarean section rate is an additional advantage to the obstetrician.

CONCLUSION

In the current study, we observed that there was reduction in total duration of labour,adequate pain relief, reduction in average blood loss, increased vaginal delivery outcomes with good APGAR scores.

For the obstetrician the preconceived protocol, helps in planning more " Day time deliveries ", and control over the key events of labour with compliant patients and co-operation of birth attenders.

The reduction in hospital stay because of increased rates of vaginal delivery with a favorable neonatal outcome, lesser Caesarean section rates and reduction in average blood loss helps the patient to plan her routine work at a faster pace.

The adequate pain relief definitely had an impact on the patients memory regarding apprehension towards labour pain. This impact will definitely decrease rates of "Demand Caesarean sections" in the future during the second delivery.

The reduction in primary caesarean rates, has a long standing effect as it brings down the number of repeat caesarean rates in the future.

The protocol can be tried in high risk patients in the future for optimal labour outcome with individualization for these high risk patients.

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PROFORMA

Patient Name: **Age:**

IP Number: **Address:**

Written informed consent:

Yes	No

Clinical History:

Obstetric code:

Gravida	Para	Live	Abortion

Menstrual history: **RMP 3 / 28**

Yes	No

– 30

LMP:

EDD:

Marital history:

Obstetric History:

Past history:

Bronchial Asthma	Cardiac disease	Thyroid disorder	DM	HT	Epilepsy	IHD	TB	Jaundice

Personal History:

General Examination:

Ht	Wt	Temp	PR	BP	CVS	RS	CNS	Anaemia	Pedal oedema

P/A :

Uterus	Contractions	Head Palpable	FHR b/ mins	Liquor

P/V :

Cervix Effacement	Dilatation Of Cervix	Membrane	Station Of Vertex	CPD	Draining

Investigation:

Hb%	Urine		Blood Group & Rh Type	HIV	HbsAg	VDRL	Blood Urea	Serum Creatinine
	Albumin	Sugar						

Admission CTG

Ultra Sound Examination

Duration of Labour

First	Second	Third

Drugs Used :

Mode of Delivery :

Apgar Score :

Birth weight :

MASTER CHART STUDY GROUP

S. No	Name	Age	I P Number	Gravida	Mean duration of Ist stage of labour hrs	Mean duration of 2nd stage of labour mins	Mean cervical dilatation Cm/hr	Pain score	Mean duration of 3rd stage of labour mins	Average blood Loss ml	Mode of Delivery	Apgar score	Adverse effects	Remarks
1	CHITRA	24	13595	PRIMI	3.2	34	2.2	1	3.5	125	LN	7/10 8/10		
2	SWATHI	25	12582	PRIMI	2.2	32	2.8	2	3.5	110	LN	7/10 8/10		
3	PRIYA	23	16290	PRIMI	3.4	44	1.8	7	6	145	VENTOUSE	7/10 8/10		FAILURE OF MATERNAL FORCES
4	NISHA	26	17593	PRIMI	2.2	34	2.8	2	3.5	120	LN	7/10 8/10		
5	MUMTAZ	22	11241	PRIMI	2.5	42	2.4	2	4	110	LN	7/10 8/10		
6	POOJA	21	11621	PRIMI	5.2	68	1.3	7	-	170	LSCS	6/10 7/10		SECONDARY ARREST OF LABOUR
7	KALYANI	24	12432	PRIMI	3.2	34	2.1	2	3.6	125	LN	7/10 8/10		
8	MUNIAMMAL	22	11322	PRIMI	3.4	36	2.2	3	3.5	130	LN	7/10 8/10		
9	MARGARET	28	12987	PRIMI	2.5	34	2.4	1	4	120	LN	7/10 8/10		
10	KOKILA	24	12992	PRIMI	3.1	38	2.0	2	3.8	130	LN	7/10 8/10		
11	PANNEER	26	14211	PRIMI	3.2	36	2.0	3	5	110	LN	7/10 8/10		
12	BEERAMMAL	28	11912	PRIMI	2.9	38	2.2	2	3.5	110	LN	7/10 8/10		
13	CHINNA PONNU	25	14559	PRIMI	3.2	56	2.0	5	-	175	LSCS	7/10 8/10		CEPHALOPELVIC DISPROPORTION

14	CHELLAMMAL	28	13392	PRIMI	3.2	36	2.0	3	3.5	125	LN	7/10 8/10		
15	KASTHURI	21	12453	PRIMI	3.2	38	2.0	3	5	110	LN	7/10 8/10		
16	MUNIAMMAL	24	13424	PRIMI	5.2	70	1.2	8	-	150	LSCS	7/10 8/10		SECONDARY ARRESTOF LBOUR
17	CHELLATHAI	23	12821	PRIMI	2.9	38	2.2	4	3.5	110	LN	7/10 8/10		
18	THANGAM	22	15344	PRIMI	3.2	42	2.1	2	3.5	110	LN	7/10 8/10		
19	KUTTY	23	13322	PRIMI	3.4	54	1.8	10	5	145	OUTLET FORCEPS	7/10 8/10		NON REASSURING FETAL HEART PATTERN
20	PREMA	25	12121	PRIMI	3.0	38	2.0	2	4	110	LN	7/10 8/10		
21	RUKMANI	24	11999	PRIMI	5.4	64	1.1	8	-	160	LSCS	7/10 8/10		CEPHALO-PELVIC DISPROPORTION
22	DEEPA	22	15245	PRIMI	3.0	36	2.0	3	4	110	LN	7/10 8/10		
23	ANITHA	24	16888	PRIMI	2.9	34	2.1	3	4	125	LN	7/10 8/10		
24	KAVITHA	23	14111	PRIMI	3.1	38	2.0	1	4	110	LN	7/10 8/10		
25	SUDHA	23	19330	PRIMI	3.2	42	2.0	2	5	120	LN	7/10 8/10		
26	CHELLAM	22	18849	PRIMI	2.9	38	2.3	2	3.6	100	LN	7/10 8/10		
27	PONMANI	28	19003	PRIMI	3.1	42	2.0	2	4	110	LN	7/10 8/10		

28	VALLI	21	16446	PRIMI	3.1	44	2.0	3	4	120	LN	7/10 8/10		
29	LILLY	23	17001	PRIMI	4.2	62	1.8	5	5	130	VENTOUSE	7/10 8/10		FAILURE OF MATERNAL FORCES
30	MARY	24	13222	PRIMI	3.0	38	2.1	4	4	125	LN	7/10 8/10		
31	SYLVIA	25	18330	PRIMI	3.8	38	2.6	5	5	125	LN	7/10 8/10		
32	SHEELA	22	12933	PRIMI	3.0	44	2.1	2	4	130	LN	7/10 8/10		
33	AKILA	22	11608	PRIMI	3.1	46	2.1	1	4	60	LN	7/10 8/10		
34	BEGUM	24	13212	PRIMI	5.2	36	1.3	7	-	160	LSCS	7/10 8/10		FETAL DISTRESS
35	RENUKA	26	10161	PRIMI	3.1	42	2.0	2	4	110	LN	7/10 8/10		
36	DIVYA	28	11880	PRIMI	2.5	44	2.4	2	4	110	LN	7/10 8/10		
37	RAMYA	24	19780	PRIMI	4.4	52	1.4	8	-	150	LSCS	7/10 8/10		CEPHALOPELVIC DISPROPORTION
38	SARASU	20	18690	PRIMI	3.1	36	2.0	3	4	110	LN	7/10 8/10		
39	MALAR KODI	22	16120	PRIMI	3.2	42	2.0	2	6	120	LN	7/10 8/10		
40	MEENATCHI	28	11009	PRIMI	3.0	52	2.1	1	4	110	OUTLET PORCEPS	7/10 8/10		FAILURE OF MATERNAL FORCES
41	KALI	24	11212	PRIMI	3.2	38	2.1	2	5	120	LN	7/10 8/10		
42	MALAR KODI	22	16904	PRIMI	3.0	38	2.4	2	5	110	LN	7/10 8/10		

43	**SUMATHI**	**23**	**10342**	**PRIMI**	**2.5**	**34**	**2.4**	**3**	**4**	**120**	**LN**	**7/10 8/10**		
44	**JEYA**	**26**	**13913**	**PRIMI**	**5.2**	**46**	**1.4**	**6**	**-**	**160**	**LSCS**	**6/10 7/10**		**NON REASSURING PATTERN FHR**
45	**RADHA**	**24**	**19218**	**PRIMI**	**3.2**	**42**	**2.2**	**2**	**6**	**110**	**LN**	**7/10 8/10**		
46	**NIRMALA**	**22**	**12991**	**PRIMI**	**3.2**	**38**	**2.4**	**3**	**6**	**120**	**LN**	**7/10 8/10**		
47	**MEENA**	**24**	**18932**	**PRIMI**	**3.0**	**42**	**2.1**	**2**	**5**	**110**	**LN**	**7/10 8/10**		
48	**KASI**	**21**	**13415**	**PRIMI**	**4.1**	**62**	**1.8**	**6**	**5**	**160**	**OUTLET FORCEPS**	**7/10 8/10**		**FAILURE OF MATERNAL FORCES**
49	**PODHU MANI**	**24**	**10009**	**PRIMI**	**3.2**	**36**	**2.0**	**2**	**6**	**110**	**LN**	**7/10 8/10**		
50	**RUSHITHA**	**22**	**10160**	**PRIMI**	**3.0**	**38**	**2.2**	**1**	**5**	**120**	**LN**	**7/10 8/10**		
51	PARVATHAM	24	10084	PRIMI	3.0	38	2.0	1	3.6	120	LN	7/108/ 10		
52	YUKTHA	24	**15695**	**PRIMI**	**3.2**	**34**	**2.0**	**1**	**4**	**125**	**LN**	**7/10 8/10**		
53	SAINA	28	**17882**	**PRIMI**	**2.2**	**36**	**2.8**	**2**	**3.5**	**110**	**LN**	**7/10 8/10**		
54	MYMOON	22	**16290**	**PRIMI**	**3.4**	**44**	**1.8**	**7**	**6**	**145**	**VENTOUSE**	**7/10 8/10**		**FAILURE OF MATERNAL FORCES**
55	MUNEERA	25	**17433**	**PRIMI**	**2.2**	**38**	**2.8**	**2**	**3.5**	**120**	**LN**	**7/10 8/10**		

56	RACHEL	23	**13441**	**PRIMI**	**2.5**	**42**	**2.4**	**2**	**4**	**110**	**LN**	**7/10 8/10**		
57	VICTORIA	26	**15621**	**PRIMI**	**5.2**	**42**	**1.2**	**7**	**-**	**170**	**LSCS**	**7/10 8/10**		**NON REASSURING FETAL HEART PATTERN**
58	SALMA	22	**12232**	**PRIMI**	**3.2**	**38**	**2.1**	**2**	**3.6**	**125**	**LN**	**7/10 8/10**		
59	SRUTHIKA	24	**16722**	**PRIMI**	**3.4**	**36**	**2.2**	**3**	**3.5**	**130**	**LN**	**7/10 8/10**		
60	ABIRAMI	24	**15487**	**PRIMI**	**2.5**	**38**	**2.4**	**1**	**4**	**120**	**LN**	**7/10 8/10**		
61	GITA	28	**12892**	**PRIMI**	**2.9**	**38**	**2.3**	**2**	**4**	**130**	**LN**	**7/10 8/10**		
62	JUNA	24	**14901**	**PRIMI**	**3.2**	**42**	**2.0**	**3**	**5**	**110**	**LN**	**7/10 8/10**		
63	TINA	26	**14512**	**PRIMI**	**2.9**	**38**	**2.1**	**2**	**3.5**	**110**	**LN**	**7/10 8/10**		
64	SUJA	22	**15659**	**PRIMI**	**3.2**	**42**	**2.0**	**2**	**5**	**125**	**LN**	**7/10 8/10**		
65	SHEILA	25	**18992**	**PRIMI**	**3.1**	**44**	**2.2**	**3**	**3.5**	**125**	**LN**	**7/10 8/10**		
66	HEERA	24	**15453**	**PRIMI**	**3.2**	**36**	**2.0**	**3**	**5**	**110**	**LN**	**7/10 8/10**		
67	REENA	22	**17824**	**PRIMI**	**3.4**	**70**	**1.8**	**8**	**-**	**150**	**LSCS**	**7/10 8/10**		**PERSISTANT ROP**
68	INIYA	23	**19021**	**PRIMI**	**3.2**	**38**	**1.9**	**4**	**3.5**	**110**	**LN**	**7/10 8/10**		
69	KUMARI	24	**15644**	**PRIMI**	**2.9**	**38**	**2.1**	**2**	**3.5**	**110**	**LN**	**7/10 8/10**		
70	SULOCHANA	23	**10022**	**PRIMI**	**3.4**	**54**	**1.8**	**10**	**5**	**145**	**OUTLET FORCEPS**	**7/10 8/10**		**NON REASSURING FETAL HEART**

														PATTERN
71	SENTHAMIL	27	**16421**	**PRIMI**	**2.9**	**36**	**2.2**	**2**	**4**	**110**	**LN**	**7/10 8/10**		
72	ILAVENI	26	**14379**	**PRIMI**	**5.4**	**64**	**1.1**	**8**	**-**	**160**	**LSCS**	**7/10 8/10**		**CEPHALO -PELVIC DISPROPO RTION**
73	PUSHPAM	23	**12365**	**PRIMI**	**3.0**	**36**	**2.0**	**3**	**4**	**110**	**LN**	**7/10 8/10**		
74	AZEEMA	24	**19888**	**PRIMI**	**3.3**	**34**	**2.1**	**3**	**4**	**125**	**LN**	**7/10 8/10**		
75	NUSHAL	27	**14111**	**PRIMI**	**3.1**	**38**	**2.0**	**1**	**4**	**110**	**LN**	**7/10 8/10**		
76	SAMEERA	24	**19760**	**PRIMI**	**3.0**	**34**	**2.0**	**2**	**5**	**120**	**LN**	**7/10 8/10**		
77	HASINA	25	**16549**	**PRIMI**	**3.2**	**34**	**1.9**	**2**	**3.6**	**100**	**LN**	**7/10 8/10**		
78	MAGATHI	26	**15403**	**PRIMI**	**2.9**	**36**	**2.1**	**2**	**4**	**110**	**LN**	**7/10 8/10**		
79	MANJAL	24	**15646**	**PRIMI**	**3.1**	**38**	**2.0**	**3**	**4**	**120**	**LN**	**7/10 8/10**		
80	ABITHA	28	**14671**	**PRIMI**	**4.2**	**62**	**1.4**	**5**	**5**	**130**	**VENTOUS E**	**7/10 8/10**		**MILD ATONIC PPH**
81	NAGARANI	23	**13200**	**PRIMI**	**3.0**	**34**	**2.1**	**4**	**4**	**125**	**LN**	**7/10 8/10**		
82	GOWRI	24	**18630**	**PRIMI**	**2.6**	**36**	**2.4**	**5**	**5**	**125**	**LN**	**7/10 8/10**		
83	SUNDARI	24	**12533**	**PRIMI**	**3.0**	**36**	**2.1**	**2**	**4**	**130**	**LN**	**7/10 8/10**		
84	JIJIBAI	26	**11288**	**PRIMI**	**3.1**	**34**	**2.1**	**1**	**4**	**60**	**LN**	**7/10 8/10**		
85	VALLIMEENA	27	**13412**	**PRIMI**	**5.2**	**36**	**1.2**	**7**	**-**	**160**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**

86	POUNU	25	**10761**	**PRIMI**	**3.1**	**34**	**2.0**	**2**	**4**	**110**	**LN**	**7/10 8/10**		
87	GUNA	25	**10880**	**PRIMI**	**2.5**	**36**	**2.4**	**2**	**4**	**110**	**LN**	**7/10 8/10**		
88	FOUSAL	26	**19580**	**PRIMI**	**4.4**	**62**	**1.4**	**8**	**-**	**150**	**LSCS**	**7/10 8/10**		**PERSISTENT ROP**
89	BENITA	24	**18090**	**PRIMI**	**3.1**	**36**	**2.0**	**3**	**4**	**110**	**LN**	**7/10 8/10**		
90	LOVY	25	**16170**	**PRIMI**	**3.1**	**42**	**2.1**	**2**	**6**	**120**	**LN**	**7/10 8/10**		
91	VANI	23	**11109**	**PRIMI**	**2.9**	**38**	**2.4**	**1**	**4**	**110**	**LN**	**7/10 8/10**		
92	SHEEBA	24	**10212**	**PRIMI**	**3.2**	**44**	**2.1**	**2**	**5**	**120**	**LN**	**7/10 8/10**		
93	BHAGHYA	25	**16954**	**PRIMI**	**3.0**	**38**	**2.2**	**2**	**5**	**110**	**LN**	**7/10 8/10**		
94	NILA	26	**12342**	**PRIMI**	**2.6**	**36**	**2.4**	**3**	**4**	**120**	**LN**	**7/10 8/10**		
95	PALLAVI	24	**13992**	**PRIMI**	**5.2**	**46**	**1.4**	**6**	**-**	**160**	**LSCS**	**6/10 7/10**		**NON REASSURING PATTERN FHR**
96	DHANALAKSHMI	23	**19518**	**PRIMI**	**3.2**	**36**	**2.2**	**2**	**6**	**110**	**LN**	**7/10 8/10**		
97	RAGAM	25	**12891**	**PRIMI**	**3.2**	**38**	**2.4**	**3**	**6**	**120**	**LN**	**7/10 8/10**		
98	NEEVU	27	**19932**	**PRIMI**	**3.0**	**36**	**2.1**	**2**	**5**	**110**	**LN**	**7/10 8/10**		
99	MUTHINA	23	**13425**	**PRIMI**	**3.4**	**62**	**1.8**	**6**	**5**	**160**	**OUTLET FORCEPS**	**7/10 8/10**		**FAILURE OF MATERNAL FORCES**
100	NEELAVENI	22	**10909**	**PRIMI**	**3.2**	**36**	**2.0**	**2**	**6**	**110**	**LN**	**7/10 8/10**		

Master Chart Control Group

S. No	Name	Age	I P Number	Gravida	Mean duration of Ist stage of labour hrs	Mean duration of 2nd stage of labour mins	Mean duration of 3rd stage of labour mins	Pain score	Mean cervical dilatation cm	Average blood Loss ml	Mode of Delivery	Apgar score	Adverse effects	Remarks
1	KALPANA	21	14595	PRIMI	5.1	52	4.5	9	1.2	210	LN	7/10 8/10		
2	SURYA	24	14582	PRIMI	5.2	64	5.0	9	1.2	200	LN	7/10 8/10		
3	SONIA	23	14290	PRIMI	5.1	62	6	8	1.1	220	LN	7/10 8/10		
4	RAMA DEVI	25	15593	PRIMI	5.4	90	-	10	0.9	250	LSCS	7/10 8/10		FETAL DISTRESS
5	LAKSHMI	24	13241	PRIMI	5.1	48	7	9	1.1	175	LN	7/10 8/10		
6	SINDHU	25	14621	PRIMI	5.1	50	6	9	1.1	170	LN	7/10 8/10		
7	JOTHII	26	15432	PRIMI	4.6	80	-	10	1.4	180	LSCS	6/10 7/10		NON REASSURING FHR
8	AMIRTHAM	28	16322	PRIMI	5.1	45	5.6	9	1.1	175	LN	7/10 8/10		
9	MARAGATHAM	24	15987	PRIMI	5.2	60	5.4	10	1.0	160	LN	7/10 8/10		
10	MERLIN	24	38992	PRIMI	5.1	65	6	9	1.2	200	VENTOUSE	7/10 8/10		FAILURE OF MATERNAL FORCES
11	KAVYA	29	16211	PRIMI	5.1	40	6.5	5	1.2	170	LN	7/10 8/10		
12	NAVITHA	24	17912	PRIMI	5.1	66	5	10	1.4	175	OUTLET FORCEPS	6/10 7/10		FAILURE OF SECONDARY MATERNAL FORCES

13	**HARINI**	**25**	**15559**	**PRIMI**	**5.1**	**45**	**5.6**	**9**	**1.3**	**170**	**LN**	**7/10 8/10**		
14	**CHELLA PONNU**	**22**	**17392**	**PRIMI**	**5.3**	**55**	**5.5**	**9**	**1.3**	**165**	**LN**	**7/10 8/10**		
15	**RASHIDA**	**29**	**16453**	**PRIMI**	**5.1**	**45**	**4.5**	**6**	**1.2**	**145**	**LN**	**7/10 8/10**		
16	**VAIKUNDAM**	**24**	**19199**	**PRIMI**	**5.4**	**75**	**7.5**	**10**	**1.2**	**175**	**OUTLET FORCEPS**	**7/10 8/10**		**FAILURE OF SECONDARY MATERNAL FORCES**
17	**VATCHALA**	**26**	**19821**	**PRIMI**	**5.1**	**60**	**6.5**	**7**	**1.2**	**170**	**LN**	**7/10 8/10**		
18	**DEVI**	**24**	**19344**	**PRIMI**	**5.1**	**50**	**-**	**9**	**1.2**	**185**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
19	**SELVI**	**29**	**19322**	**PRIMI**	**5.4**	**30**	**6**	**9**	**1.1**	**170**	**LN**	**7/10 8/10**		
20	**SUMAN**	**24**	**11109**	**PRIMI**	**5.2**	**50**	**6.5**	**10**	**1.2**	**175**	**LN**	**7/10 8/10**		
21	**ARTHI**	**23**	**18999**	**PRIMI**	**5.2**	**80**	**-**	**10**	**1.1**	**180**	**LSCS**	**6/10 7/10**		**PROLONGED 2ND STAGE**
22	**ASHWARYA**	**29**	**17245**	**PRIMI**	**4.4**	**30**	**6.5**	**9**	**1.6**	**140**	**LN**	**7/10 8/10**		
23	**SUMATHI**	**24**	**19888**	**PRIMI**	**5.6**	**70**	**-**	**10**	**1.4**	**150**	**LSCS**	**7/10 8/10**		**UTERINE DYSTOCIA**
24	**SUMITHRA**	**25**	**18111**	**PRIMI**	**4.4**	**50**	**5.5**	**9**	**1.5**	**135**	**LN**	**7/10 8/10**		
25	**RAJI**	**24**	**16330**	**PRIMI**	**4.2**	**50**	**5.5**	**6**	**1.4**	**145**	**LN**	**7/10 8/10**		
26	**MEERA**	**25**	**15849**	**PRIMI**	**5.4**	**110**	**-**	**10**	**0.9**	**175**	**LSCS**	**7/10 8/10**		**SECONDARY ARREST OF LABOUR**
27	**REVATHI**	**24**	**18003**	**PRIMI**	**4.4**	**30**	**5.5**	**7**	**1.5**	**145**	**LN**	**7/10 8/10**		

28	**VIJAYA**	**21**	**17446**	**PRIMI**	**5.1**	**45**	**4.5**	**9**	**1.2**	**155**	**LN**	**7/10 8/10**		
29	**SATHYA**	**29**	**17001**	**PRIMI**	**5.1**	**48**	**6.5**	**9**	**1.3**	**170**	**OUTLET FORCEPS**	**7/10 8/10**		**FAILURE OF SECONDARY FORCES**
30	**VANI**	**23**	**15222**	**PRIMI**	**4.4**	**50**	**7**	**7**	**1.4**	**140**	**LN**	**7/10 8/10**		
31	**MUTHU**	**24**	**17330**	**PRIMI**	**4.4**	**54**	**6**	**9**	**1.4**	**135**	**LN**	**7/10 8/10**		
32	**KALA**	**24**	**17933**	**PRIMI**	**4.4**	**40**	**5.5**	**9**	**1.5**	**120**	**LN**	**7/10 8/10**		
33	**ARASI**	**25**	**18008**	**PRIMI**	**5.4**	**70**	**-**	**10**	**1.2**	**175**	**LSCS**	**7/10 8/10**		**NON REASSURING FHR**
34	**MANI**	**28**	**18212**	**PRIMI**	**4.5**	**44**	**6**	**7**	**1.5**	**150**	**LN**	**7/10 8/10**		
35	**MONIKA**	**24**	**16161**	**PRIMI**	**5.2**	**48**	**8**	**10**	**1.4**	**210**	**OUTLET FORCEPS**	**7/10 8/10**		**FETAL DISTRESS**
36	**MUTHUMANI**	**29**	**12880**	**PRIMI**	**4.2**	**30**	**4.5**	**9**	**1.6**	**165**	**LN**	**7/10 8/10**		
37	**PAULA**	**24**	**12780**	**PRIMI**	**5.1**	**60**	**-**	**9**	**1.5**	**185**	**LSCS**	**7/10 8/10**		**CEPHALO PELVIC DISPROPORTION**
38	**AMMULU**	**27**	**14690**	**PRIMI**	**3.5**	**35**	**6.5**	**8**	**1.8**	**170**	**LN**	**7/10 8/10**		
39	**UTHRA**	**24**	**12120**	**PRIMI**	**5.1**	**110**	**-**	**10**	**1.2**	**190**	**LSCS**	**7/10 8/10**		**PROLONGED 2ND STAGE**
40	**MAYIL**	**25**	**14009**	**PRIMI**	**5.4**	**90**	**9**	**10**	**1.2**	**250**	**LSCS**	**7/10 8/10**		**CEPHALO PELVIC DISPROPORTION**

41	**MANJU**	**24**	**13212**	**PRIMI**	**5.3**	**70**	**8**	**9**	**1.3**	**180**	**LN**	**7/10 8/10**		
42	**ROSHINI**	**24**	**16904**	**PRIMI**	**4.4**	**60**	**7**	**6**	**1.5**	**175**	**LN**	**7/10 8/10**		
43	**MAHESHWARI**	**25**	**13342**	**PRIMI**	**4.6**	**63**	**9**	**9**	**1.4**	**170**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
44	**MANGAI**	**26**	**14913**	**PRIMI**	**5.1**	**40**	**8**	**7**	**1.2**	**180**	**LN**	**7/10 8/10**		
45	**VALARMATHYI**	**24**	**14212**	**PRIMI**	**4.5**	**60**	**8**	**9**	**1.5**	**175**	**LN**	**7/10 8/10**		
46	**VASANTHI**	**26**	**15991**	**PRIMI**	**4.5**	**110**	**-**	**9**	**1.5**	**180**	**LSCS**	**7/10 8/10**		**PROLONGED 2ND STAGE**
47	**PONNURANGAM**	**25**	**19932**	**PRIMI**	**5.1**	**70**	**4.5**	**10**	**1.2**	**165**	**LN**	**7/10 8/10**		
48	**SRIVARI**	**24**	**18415**	**PRIMI**	**5.2**	**40**	**8**	**9**	**1.2**	**165**	**LN**	**7/10 8/10**		
49	**KRITHIKA**	**24**	**17009**	**PRIMI**	**4.5**	**40**	**9**	**6**	**1.5**	**180**	**LN**	**7/10 8/10**		
50	**RADHIKA**	**26**	**16160**	**PRIMI**	**5.4**	**110**	**9**	**7**	**1.1**	**230**	**LSCS**	**7/10 8/10**		**PROLONGED II STAGE**
51	VEDHA	**21**	**14342**	**PRIMI**	**5.1**	**52**	**4.5**	**9**	**1.2**	**210**	**VENTOUSE**	**7/10 8/10**		**FAILURE OF MATERNAL FORCES**
52	POORNIMA	**24**	**14211**	**PRIMI**	**5.2**	**64**	**5.0**	**9**	**1.2**	**200**	**LN**	**7/10 8/10**		
53	DEEPIKA	**23**	**14679**	**PRIMI**	**5.1**	**62**	**6**	**8**	**1.1**	**220**	**LN**	**7/10 8/10**		
54	RENU	**25**	**15616**	**PRIMI**	**5.4**	**90**	**-**	**10**	**0.9**	**250**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**

55	MANU	24	13908	PRIMI	5.1	48	5.5	9	1.1	175	LN	7/10 8/10		
56	ABILASHA	25	14656	PRIMI	5.1	50	6	9	1.1	170	LN	7/10 8/10		
57	ANDAL	26	15213	PRIMI	4.6	80	-	10	1.4	180	LSCS	6/10 7/10		NON REASSURING FHR
58	ARULMOZHI	28	16123	PRIMI	5.1	45	4.5	9	1.1	175	LN	7/10 8/10		
59	EPSIBA	24	15453	PRIMI	5.2	60	5.5	10	1.0	160	VENTOUSE	7/10 8/10		FAILURE OF MATERNAL FORCES
60	PUNITHA	24	38212	PRIMI	5.1	65	6	9	1.2	165	LN	7/10 8/10		
61	VELVIZHI	29	16256	PRIMI	5.1	40	6.5	5	1.2	170	LN	7/10 8/10		
62	AYESHA	24	17891	PRIMI	5.1	66	5	10	1.4	175	OUTLET FORCEPS	6/10 7/10		FAILURE OF SECONDARY MATERNAL FORCES
63	VIDYA DEVI	25	15212	PRIMI	5.1	45	7.5	9	1.3	170	LN	7/10 8/10		
64	MARIAM	22	17678	PRIMI	5.3	55	-	9	1.3	200	LSCS	7/10 8/10		CEPHALO PELVIC DISPROPORTION
65	VELKANI	29	16321	PRIMI	5.1	45	6	6	1.2	145	LN	7/10 8/10		
66	LUIJIM	24	19890	PRIMI	5.4	75	7.5	10	1.2	175	OUTLET FORCEPS	7/10 8/10		FAILURE OF SECONDARY MATERNAL

														FORCES
67	FATHIMA	**26**	**19889**	**PRIMI**	**5.1**	**60**	**6.5**	**7**	**1.2**	**170**	**LN**	**7/10 8/10**		
68	SHYAMALA	**24**	**19332**	**PRIMI**	**5.1**	**50**	**5.5**	**9**	**1.2**	**165**	**LN**	**7/10 8/10**		
69	PRINCY	**29**	**19567**	**PRIMI**	**5.4**	**30**	**6**	**9**	**1.1**	**210**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
70	MALATHI	**24**	**11123**	**PRIMI**	**5.2**	**50**	**6.5**	**10**	**1.2**	**175**	**LN**	**7/10 8/10**		
71	SARALA	**23**	**18287**	**PRIMI**	**5.2**	**80**	**-**	**10**	**1.1**	**180**	**LSCS**	**6/10 7/10**		**PROLONGED 2ND STAGE**
72	JENITHA	**29**	**17679**	**PRIMI**	**4.4**	**30**	**6.5**	**9**	**1.6**	**140**	**LN**	**7/10 8/10**		
73	JAILANI	**24**	**19123**	**PRIMI**	**5.6**	**70**	**-**	**10**	**1.4**	**150**	**LSCS**	**7/10 8/10**		**UTERINE DYSTOCIA**
74	SARADHA	**25**	**18453**	**PRIMI**	**4.4**	**50**	**6.5**	**9**	**1.5**	**135**	**LN**	**7/10 8/10**		
75	ANURADHA	**24**	**16123**	**PRIMI**	**4.2**	**50**	**7**	**6**	**1.4**	**145**	**LN**	**7/10 8/10**		
76	JANSI	**25**	**15789**	**PRIMI**	**5.4**	**110**	**-**	**10**	**0.9**	**175**	**LSCS**	**7/10 8/10**		**SECONDARY ARREST OF LABOUR**
77	KAYALVIZHI	**24**	**18210**	**PRIMI**	**4.4**	**30**	**5.5**	**7**	**1.5**	**145**	**LN**	**7/10 8/10**		
78	SABARI	**21**	**17412**	**PRIMI**	**5.1**	**45**	**7**	**9**	**1.2**	**155**	**LN**	**7/10 8/10**		

79	SUGANYA	**29**	**17123**	**PRIMI**	**5.1**	**30**	**6.5**	**9**	**1.3**	**145**	**LN**	**7/10 8/10**		
80	MITHUNA	**23**	**15345**	**PRIMI**	**4.4**	**50**	**-**	**7**	**1.4**	**210**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
81	SANGAMITHRA	**24**	**17567**	**PRIMI**	**4.4**	**54**	**6**	**9**	**1.4**	**135**	**LN**	**7/10 8/10**		
82	NAVITHA	**24**	**17990**	**PRIMI**	**4.4**	**40**	**5.5**	**9**	**1.5**	**120**	**LN**	**7/10 8/10**		
83	VEEHNA	**25**	**18123**	**PRIMI**	**5.4**	**70**	**-**	**10**	**1.2**	**175**	**LSCS**	**7/10 8/10**		**NON REASSURING FHR**
84	AISHU	**28**	**18348**	**PRIMI**	**4.5**	**44**	**6**	**7**	**1.5**	**150**	**LN**	**7/10 8/10**		
85	ZEENAT	**24**	**16279**	**PRIMI**	**5.2**	**50**	**8**	**10**	**1.4**	**175**	**LN**	**7/10 8/10**		
86	BINI	**29**	**12564**	**PRIMI**	**5.4**	**44**	**8**	**9**	**1.1**	**210**	**VENTOUSE**	**7/10 8/10**		**FAILURE OF MATERNAL FORCES**
87	KOSHAL	**24**	**12321**	**PRIMI**	**4.4**	**60**	**9**	**9**	**1.5**	**175**	**LN**	**7/10 8/10**		
88	GULABI	**27**	**14212**	**PRIMI**	**3.5**	**35**	**8**	**8**	**1.8**	**170**	**LN**	**7/10 8/10**		
89	FAREEHA	**24**	**12176**	**PRIMI**	**5.1**	**110**	**-**	**10**	**1.2**	**190**	**LSCS**	**7/10 8/10**		**PROLONGED 2ND STAGE**
90	SHREYA	**25**	**14909**	**PRIMI**	**5.4**	**90**	**9**	**10**	**1.2**	**250**	**LSCS**	**7/10 8/10**		**CEPHALO PELVIC DISPROPORTION**

91	CYNTHIA	**24**	**16452**	**PRIMI**	**5.3**	**70**	**8**	**9**	**1.3**	**180**	**LN**	**7/10 8/10**		
92	LOCHINI	**24**	**13454**	**PRIMI**	**4.4**	**60**	**5.5**	**6**	**1.5**	**175**	**LN**	**7/10 8/10**		
93	ASHTALKSHMI	**25**	**14232**	**PRIMI**	**6.0**	**110**	**9**	**9**	**1.0**	**210**	**LSCS**	**7/10 8/10**		**SECONDARY ARREST OF LABOUR**
94	REEMA	**26**	**18233**	**PRIMI**	**5.1**	**40**	**8**	**7**	**1.2**	**220**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
95	AMALA	**24**	**13412**	**PRIMI**	**4.5**	**60**	**8**	**9**	**1.5**	**175**	**LN**	**7/10 8/10**		
96	KAJAL	**26**	**15781**	**PRIMI**	**4.5**	**110**	**-**	**9**	**1.5**	**180**	**LSCS**	**7/10 8/10**		**PROLONGED 2ND STAGE**
97	POORVIKA	**25**	**13232**	**PRIMI**	**5.1**	**70**	**5.4**	**10**	**1.2**	**165**	**LN**	**7/10 8/10**		
98	NOOR JAHAN	**24**	**18915**	**PRIMI**	**5.2**	**40**	**-**	**9**	**1.2**	**175**	**LSCS**	**7/10 8/10**		**FETAL DISTRESS**
99	SUMAN	**24**	**14309**	**PRIMI**	**4.5**	**40**	**5.5**	**6**	**1.5**	**180**	**LN**	**7/10 8/10**		
100	RATHNA	**26**	**16450**	**PRIMI**	**5.4**	**44**	**9**	**7**	**1.1**	**210**	**OUTLET FORCEPS**	**7/10 8/10**		**NON REASSURING FETAL HEART PATTERN**